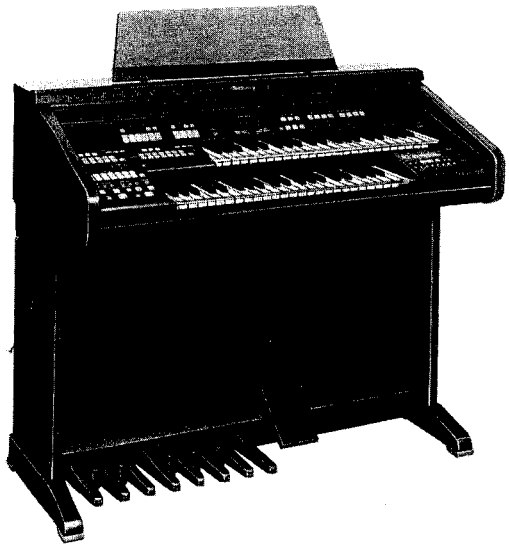
ORDER NO. EMID911341
A4
5474

Service Manual

Electronic Organ

SX-EN4

(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW), (EA), (EP), (EK), (XL), (XR), (XS), (XD), (X)



AREAS

(M):	U.S.A.	(EK):	the United Kingdom
(MC):	Canada	(XL):	New Zealand
(XM):	Mexico	(XR):	Australia
(EN):	Norway, Sweden, Denmark, Finland	(XS):	Malaysia, Singapore, South Africa
(EH):	Holland	(XD):	Saudi Arabia, Kuwait
(EF):	France, Italy, Belgium	(X):	the Middle East, Indonesia, Hong Kong, the Philippines, Thailand, Taiwan
(EZ):	Germany		
(EW):	Switzerland		
(EA):	Austria		
(EP):	Spain, Portugal, Greece		

■ Specifications

KEYBOARD			UPPER KEYBOARD 44 KEYS LOWER KEYBOARD 44 KEYS PEDAL KEYBOARD 13 KEYS
SOUND GENERATOR			PCM
MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY			32 NOTES (NUMBER OF NOTES WHICH CAN BE INPUT SIMULTANEOUSLY: UPPER KEYBOARD 8 NOTES, LOWER KEYBOARD 8 NOTES, PEDAL KEYBOARD 1 NOTE)
SOUNDS	ORCHESTRAL CONDUCTOR		○
	PARTS		UPPER KEYBOARD: TAB & ORGAN, POLY, SPECIAL, SOLO LOWER KEYBOARD: TAB & ORGAN, POLY, SPECIAL, SOLO
	UPPER	POLY, SPECIAL, SOLO	42 SOUNDS (14 SOUNDS×3 VARIATIONS) PIANO, ELECTRIC PIANO, HARPSICHORD, MALLET, GUITAR, ELECTRIC GUITAR, SYNTH, BRASS, TRUMPET, SAX/SYNTH BRASS, REED, FLUTE/OBOE, VOCAL, STRINGS
		TAB	FLUTE 16', 8', 4', 2-2/3', 2' PERC 2-2/3'
		ORGAN	1~6
	LOWER	POLY, SPECIAL, SOLO	30 SOUNDS (10 SOUNDS×3 VARIATIONS) PIANO, ELECTRIC PIANO, HARPSICHORD, GUITAR, ELECTRIC GUITAR, BRASS, SAX/SYNTH BRASS, REED, VOCAL, STRINGS
		TAB	8', 4', 2-2/3', 2'
		ORGAN	1~4
	BASS		15 SOUNDS (5 SOUNDS×3 VARIATIONS) ORGAN, ACOUSTIC, ELECTRIC, CHOPPER, SPECIAL
	ONE TOUCH REGISTRATION		○

EFFECTS	SUSTAIN	UPPER, LOWER, BASS
	EFFECT	UPPER, LOWER, BASS
	TOUCH	UPPER, LOWER
	DIGITAL REVERB	○ (ROOM, STAGE, HALL)
	GLIDE	UPPER
	TREMOLO	UPPER TAB & ORGAN, LOWER TAB & ORGAN (SLOW/FAST)
	CELESTE	UPPER TAB & ORGAN, LOWER TAB & ORGAN
RHYTHM	RHYTHM	42 RHYTHMS (14 RHYTHMS×3 VARIATIONS) MARCH, COUNTRY, WALTZ 1, 2, SWING 1, 2, LATIN 1, 2, 8 BEAT, ROCK, 16 BEAT 1, 2, JAZZ ROCK, DISCO
	CONTROL	START/STOP, SYNCHRO & BREAK, INTRO & ENDING, FILL IN 1, 2, COUNT INTRO, TEMPO
	KEYBOARD PERCUSSION	34 KEYS
AUTO PLAY CHORD		AUTO PLAY CHORD (FINGERED 1, 2, MEMORY), DYNAMIC ACCOMP, ONE TOUCH PLAY, MUSIC STYLE ARRANGER
TECHNI-CHORD		○
VOICE SETTING COMPUTER		1~6
DISPLAY		○ (LCD)
DEMO		○
COMPOSER		5 TRACKS (PART: BASS, ACCOMP 1, 2, 3, DRUMS) STORAGE CAPACITY: APPROX. 1800 NOTES RECORDING MODE: REALTIME EDIT FUNCTIONS: COMPOSER CLEAR, BAR, BEAT, QUANTIZE, PERCUSSION ERASE

Technics

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SEQUENCER	8 TRACKS (PART: UPPER, LOWER, BASS, CHORD, UPPER POLY, LOWER POLY, DRUMS, CONTROL) STORAGE CAPACITY: APPROX. 6000 NOTES RECORDING MODE: REAL TIME, STEP (CHORD, RHYTHM) EDIT FUNCTIONS: SONG CLEAR, TRACK CLEAR, TRACK ASSIGN
MIDI	CHANNEL, OCTAVE SHIFT, LOCAL CONTROL, VSC PROGRAM CHANGE, START/STOP, MIDI CLOCK, SONG SELECT, PROGRAM CHANGE MODE, NOTE ONLY, MIDI LOAD, MIDI OUT
CONTROL	VOLUME, TEMPO/PROGRAM, TRANSPOSE
EXTERNAL MEMORY	DIGITAL DISK RECORDER (OPTIONAL/ALREADY INSTALLED IN SOME AREAS)
TERMINALS	PHONES×2, LINE OUT (R/R+L, L), AUX IN (R/R+L, L), MIDI (IN, OUT, THRU)
OTHERS	POWER SWITCH, MAIN VOLUME, EXPRESSION PEDAL, FOOT SWITCH

OUTPUT	100W
SPEAKERS	20cm×2, (13cm×6cm)×2
POWER REQUIREMENT	260W, 160W (NORTH AMERICA AND MEXICO)
	AC120/220/240V 50/60 Hz AC120V 60 Hz (NORTH AMERICA AND MEXICO) AC230V 50/60 Hz (EUROPE EXCEPT FOR UNITED KINGDOM)
DIMENSIONS (W×H×D)	111cm×114.2cm×53.5cm (43-11/16"×44-31/32"×21-1/16") 111cm×114.2cm×58.9cm (43-11/16"×44-31/32"×23-3/16") (USA AND MEXICO)
NET WEIGHT	63 kg (138.9 lbs.) 64 kg (141.1 lbs.) (USA AND MEXICO)

- Specifications are subject to change without notice for further improvement.

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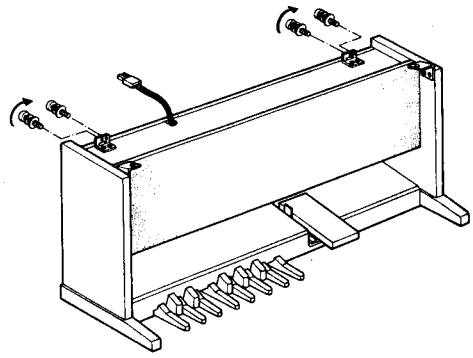
HOW TO ASSEMBLE THE ORGAN

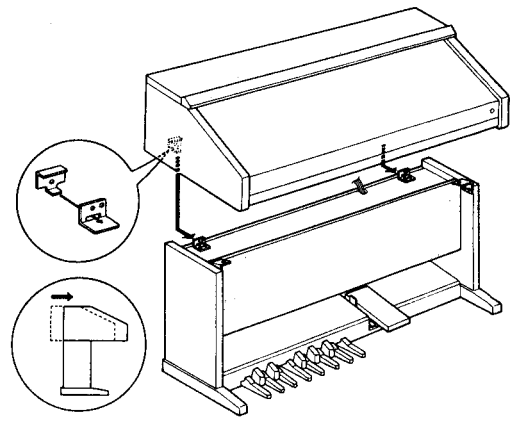
- To prevent the upper organ part from falling off the lower organ part, secure it firmly with the bolts.

1 On the lower organ part, remove the four bolts from the metal joints.
Lay the cords to the back of the lower organ part.



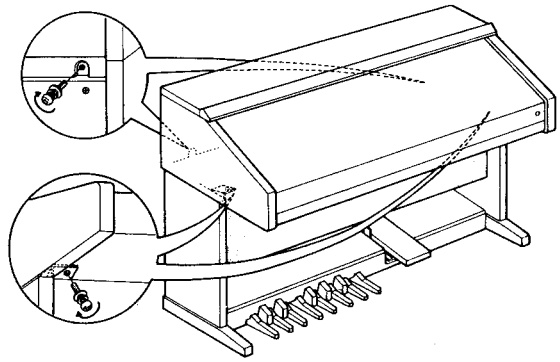
[Fig. 1]

2 Place the upper organ part on the lower organ part, making sure to fit the metal pieces together.



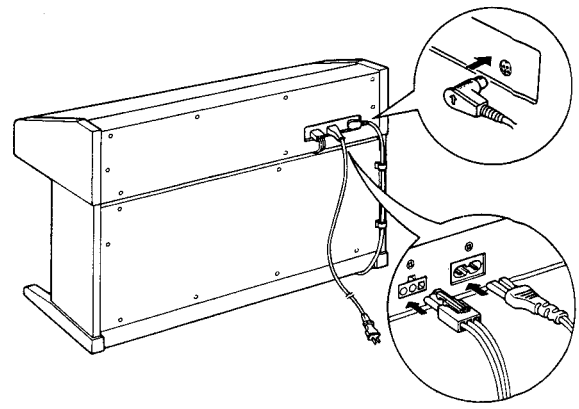
[Fig. 2]

3 Using the four bolts removed in step **1**, secure the upper organ part to the lower organ part as shown in the figure.



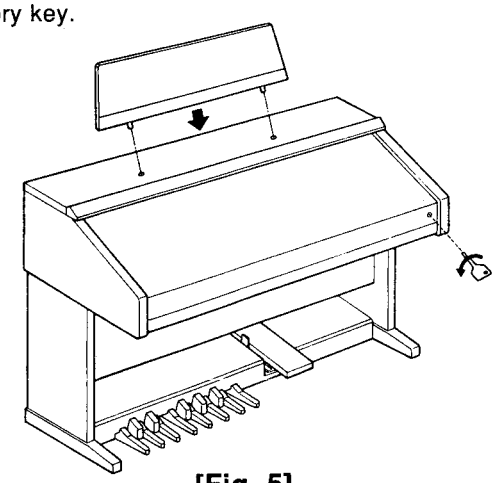
[Fig. 3]

4 Connect the power cord, speaker cord and pedal cords as shown.



[Fig. 4]

5 Insert the music stand as shown.
Unlock the cover with the accessory key.



[Fig. 5]

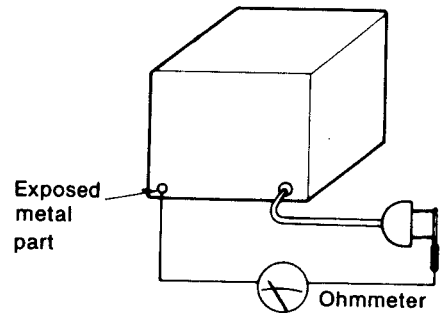
SAFETY PRECAUTION (This "safety precaution" is for the U.S.A. only)

• Safety Precaution

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• Insulation Resistance Test

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screw heads, connectors, control shafts, handle brackets, etc. Measurements should range from 4 MΩ to infinity for all exposed parts.

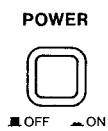


Resistance=4MΩ to ∞

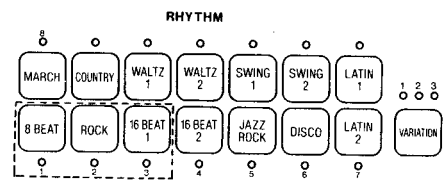
INITIAL SETTING

■ The initial setting function is used to return to the original factory settings, and to reset the customer settings and misoperations.

1. Press the **POWER** button to turn off the instrument.

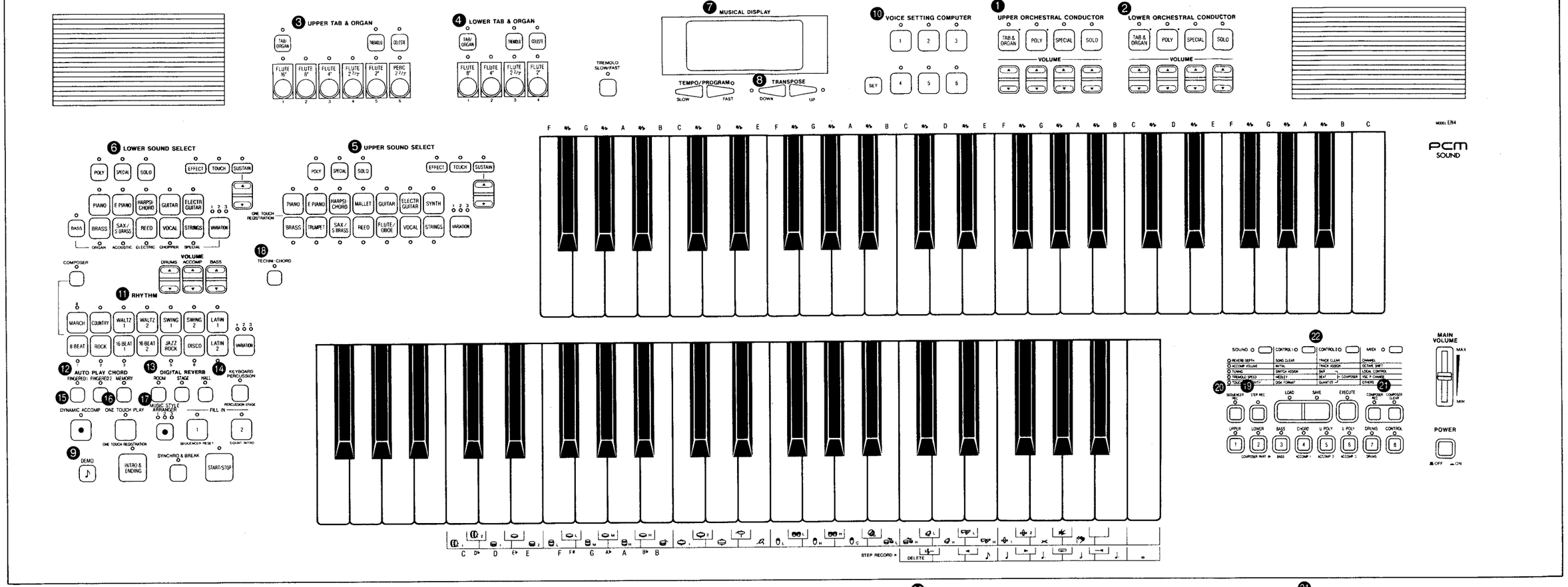


2. While pressing the three lower left buttons in the **RHYTHM** section at the same time, turn the **POWER** button on again.



NOTE:
All stored data in the **SEQUENCER** and **COMPOSER** and other settings are initialized with this operation.

ARRANGEMENT OF CONTROL PANEL



BASIC FUNCTIONS

❶ UPPER ORCHESTRAL CONDUCTOR
Select the part to be played on the upper keyboard—**POLY**, **SPECIAL**, **SOLO**, **TAB & ORGAN**. When **TAB & ORGAN** is on, **FLUTE** or **ORGAN** sounds can be selected for the upper keyboard. The **VOLUME** buttons are used to regulate the volume balance of each upper keyboard part.

❷ LOWER ORCHESTRAL CONDUCTOR
Select the part to be played on the lower keyboard—**POLY**, **SPECIAL**, **SOLO**, **TAB & ORGAN**. When **TAB & ORGAN** is on, **FLUTE** or **ORGAN** sounds can be selected for the lower keyboard. The **VOLUME** buttons are used to regulate the volume balance of each lower keyboard part.

❸ UPPER TAB & ORGAN
Assign **FLUTE** sounds and an **ORGAN** sound to the upper keyboard **TAB & ORGAN** part. Add **TREMOLO** and **CELESTE** effects to the sound by turning on the respective buttons.

❹ LOWER TAB & ORGAN
Assign **FLUTE** sounds and an **ORGAN** sound to the lower keyboard **TAB & ORGAN** part. Add **TREMOLO** and **CELESTE** effects to the sound by turning on the respective buttons.

❺ UPPER SOUND SELECT
Assign the desired sound to each of the upper keyboard parts—**POLY**, **SPECIAL** and **SOLO**. Each sound has three variations. Add character to the sound with the **EFFECT**, **TOUCH** and **SUSTAIN** buttons.

❻ LOWER SOUND SELECT
Assign the desired sound to each of the lower keyboard parts—**POLY**, **SPECIAL** and **SOLO**—and assign a **BASS** sound to the pedal keyboard. Each sound has three variations. Add character to the sound with the **EFFECT**, **TOUCH** (not available for **BASS**) and **SUSTAIN** buttons.

❼ MUSICAL DISPLAY
In the normal mode, the **MUSICAL DISPLAY** indicates the tempo of the rhythm, the beat and the name of the chord specified on the lower keyboard. When setting any of the various sound and memory functions, the corresponding display is shown.

❽ TRANSPOSE
C is the standard setting, but you can raise or lower the key of the entire instrument with these two buttons. The buttons are also used when making the settings for other functions.

⑨ DEMO
An automatic performance introduces you to the organ's sounds and rhythms.

⑩ VOICE SETTING COMPUTER
Set up the sounds, effects and volumes for each part, and then store the settings in one of the six memory buttons for instant recall as you play. You can expand the range of storable settings to include the rhythm selection, tempo settings and more.

⑪ RHYTHM
Choose from 14 preset automatic rhythms, each with three variations. An additional 8 memory locations are reserved for user-created rhythms. Other rhythm controls are **START/STOP**, **SYNCHRO & BREAK**, **INTRO & ENDING**, **COUNT INTRO**, and **FILL IN 1** and **2**. The volume is adjusted with the **DRUMS** buttons in the **VOLUME** section.

⑫ AUTO PLAY CHORD
This feature is activated when the **FINGERED 1** or **FINGERED 2** button is turned on. An automatic accompaniment appropriate for the selected rhythm is produced when you play a chord on the lower keyboard. **MEMORY** allows you to continue the accompaniment even after the chord keys are released. The volume for each part of the **AUTO PLAY CHORD** (**DRUMS**, **BASS**, **ACCOMP**) is adjusted with the respective buttons in the **VOLUME** section.

⑬ DIGITAL REVERB
Press one of the three **DIGITAL REVERB** buttons—**ROOM**, **STAGE** or **HALL**—to add the corresponding reverberation effect to the sound.

⑭ KEYBOARD PERCUSSION
One press of the **KEYBOARD PERCUSSION** button transforms your lower keyboard into a whole band of percussion instruments and special sounds. The keys are picture-coded for quick and easy selection.

⑮ DYNAMIC ACCOMP
This feature automatically changes each accompaniment pattern of the **AUTO PLAY CHORD** depending on the type of performance.

⑯ ONE TOUCH PLAY
Select a rhythm and press the **ONE TOUCH PLAY** button until the panel settings change. The sounds and effects perfect for the selected rhythm are automatically set in seconds. Or use it as a **ONE TOUCH REGISTRATION** button to automatically match the lower and pedal keyboard settings to the selected upper keyboard sound.

⑰ MUSIC STYLE ARRANGER
A tap of a button during your performance changes the rhythm and sounds to a simpler or more complex arrangement to match the feeling of the music.

⑱ TECHNI-CHORD
Chord notes played on the lower keyboard are added to the melody notes played on the upper keyboard. Choose from four harmony styles.

⑲ STEP REC
Store the chord progression for an entire song for automatic playback when you use the **AUTO PLAY CHORD**.

⑳ SEQUENCER
With this feature you can separately play and record the parts for an entire song. Then have the whole ensemble performance played back automatically.

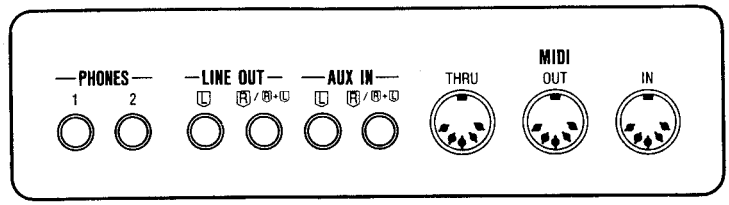
㉑ COMPOSER
Create original rhythm patterns or modify preset rhythms. Store up to 8 new rhythms in the reserved memory locations and recall them as you play, just like the preset rhythms.

㉒ Program section
This matrix is used to select various functions in conjunction with making the sound settings, initializing the memories, recording a performance, creating an accompaniment pattern, using the Digital Disk Recorder and making the MIDI settings.

㉓ Expression pedal/foot switch
Control the volume of all the organ sounds as you play to add expression to the music. The foot switch on the side of the pedal is used as a glide control to lower the pitch of the organ by one half-tone, but you can assign one of various other functions to the foot switch.

㉔ Digital Disk Recorder (optional)
The Digital Disk Recorder allows you to store up to 20 sequencer performances on a 3.5-in. 2DD memory disk.

TERMINALS



(Beneath the right side of the keyboard)

PHONES (Use headphones with over 16Ω impedance.)
For silent practice, headphones (option) may be used. When plugged in, the speaker system is automatically switched off, and the sound is heard only through the headphones.

AUX IN (input level 0.5 Vrms, 33 kΩ)
Other instruments such as a sound generator can be connected to this terminal, and the sound will be output from the Organ's speakers. To receive monaural sound, connect the other instrument to the **R/R+L** terminal. (Do not connect the **L** terminal.)

LINE OUT (output level 1.5 Vrms, 600 Ω)
By connecting an external high-power amplifier, the sound can be reproduced at a high volume. To output monaural sound, connect the external equipment to the **R/R+L** terminal. (Do not connect the **L** terminal.)

MIDI
MIDI is standard specification that enables connection to equipment such as synthesizers and personal computers. Data transmission and reception are possible between the Technics organ and equipment provided with MIDI terminals.

IN: The terminal that receives data from external equipment.
OUT: The terminal that transmits data from the organ to external equipment.
THRU: The terminal that transfers data from the **IN** terminal directly to other equipment.

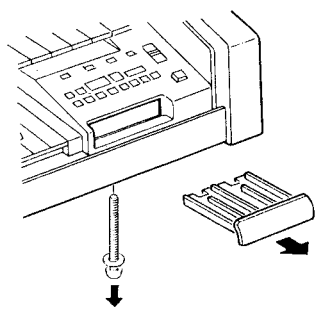
- Use a 5-pin DIN cord (less than 15m long) for these connections.

DIGITAL DISK RECORDER SY-FD20 (OPTION)

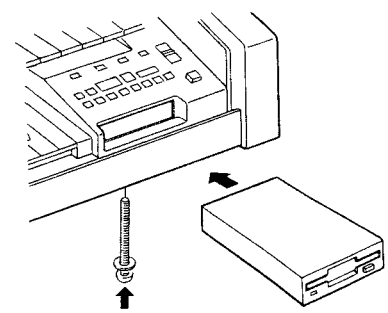
Make sure that the power to the organ is turned off.

■ **For the United Kingdom [EK]**
The SX-EN4 sold in the United Kingdom has a Digital Disk Recorder already installed. This Digital Disk Recorder is a unit made especially for the SX-EN4 and is different from the separately sold SY-FD20. Do not use it in other models.

1. Remove the cover from the connector unit (right end of the lower keyboard) by first removing the screw (beneath the keyboard) with a cross-point screwdriver.

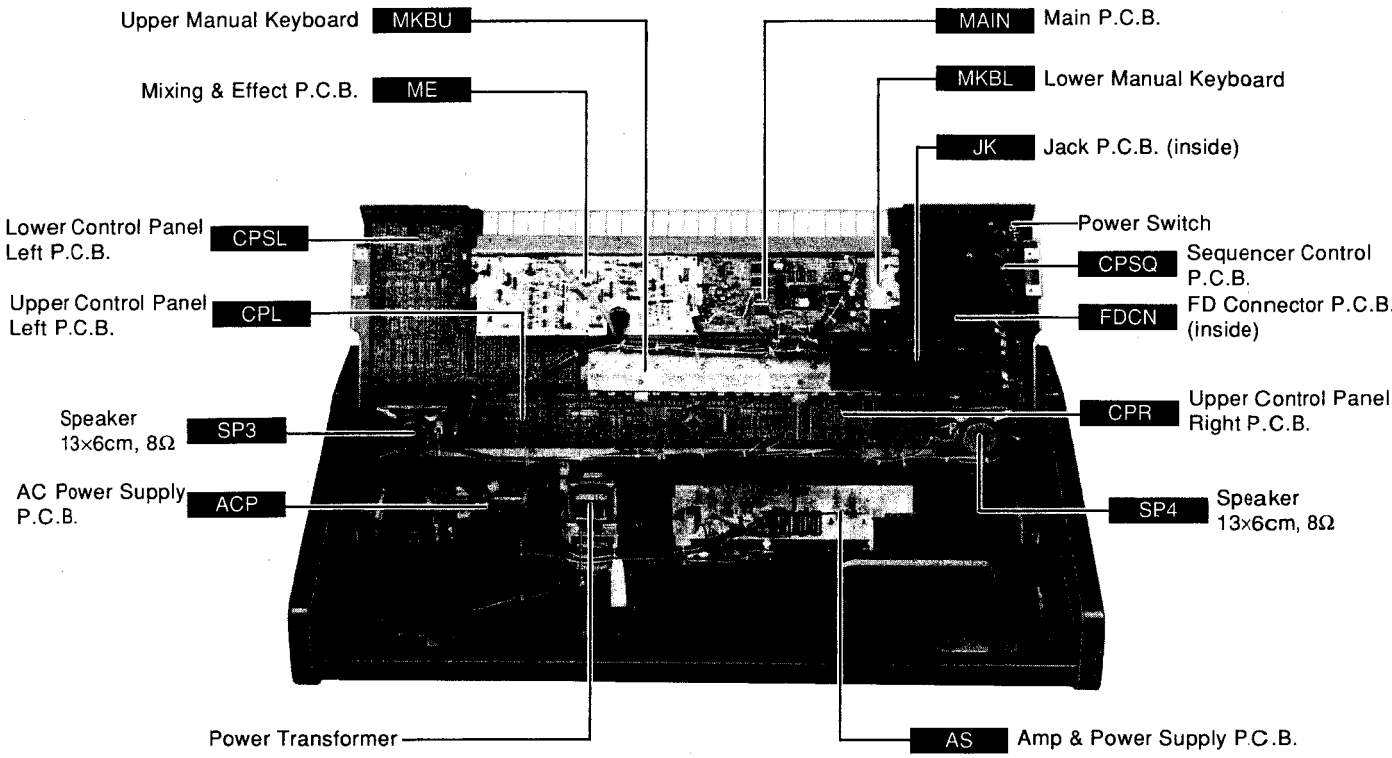


2. Insert the Digital Disk Recorder and push it in firmly and completely. Secure it with the screw you removed in step 1.

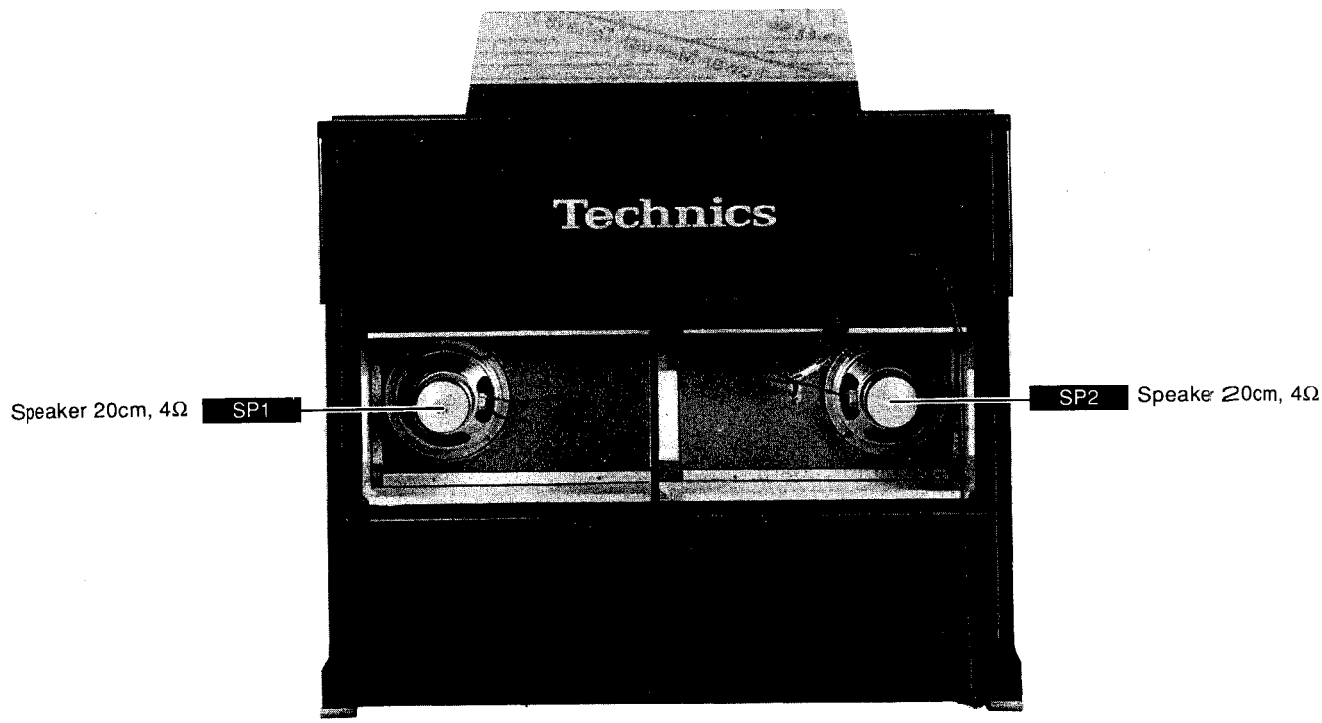


- Note: Be sure to affix the Digital Disk Recorder with the same screw which was used to affix the cover, in order to avoid damage to the Digital Disk Recorder.

PARTS LOCATION


Upper Manual Keyboard MKBU
Mixing & Effect P.C.B. ME
MAIN Main P.C.B.
MKBL Lower Manual Keyboard
JK Jack P.C.B. (inside)
Lower Control Panel Left P.C.B. CPSL
Upper Control Panel Left P.C.B. CPL
Power Switch
CPSQ Sequencer Control P.C.B.
FDCN FD Connector P.C.B. (inside)
Speaker 13x6cm, 8Ω SP3
CPR Upper Control Panel Right P.C.B.
AC Power Supply P.C.B. ACP
SP4 Speaker 13x6cm, 8Ω
Power Transformer
AS Amp & Power Supply P.C.B.

[Photo-1]

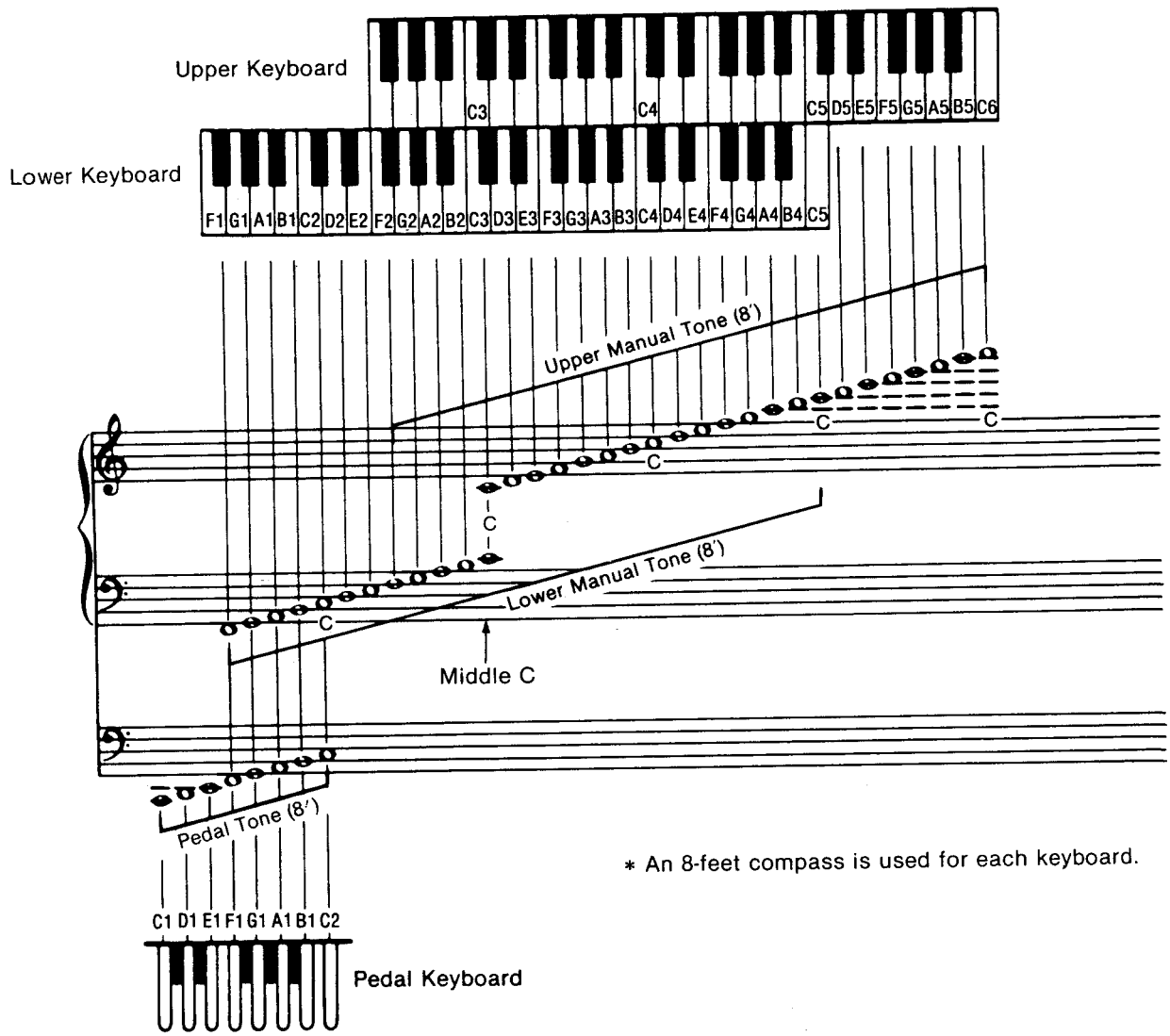


[Photo-2]

KEYBOARD RANGES

• This manual keyboard features Touch Response, by which you control the volume by playing the keys harder or softer.

Upper Keyboard .....44 Keys
Lower Keyboard .....44 Keys
Pedal keyboard .....13 Keys

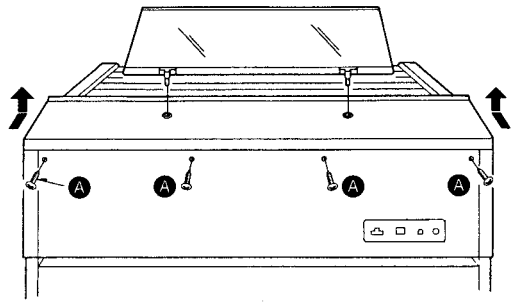

Upper Keyboard
C3
C4
C5 D5 E5 F5 G5 A5 B5 C6
Lower Keyboard
F1 G1 A1 B1 C2 D2 E2 F2 G2 A2 B2 C3 D3 E3 F3 G3 A3 B3 C4 D4 E4 F4 G4 A4 B4 C5
Upper Manual Tone (8')
Lower Manual Tone (8')
Middle C
Pedal Tone (8')
C1 D1 E1 F1 G1 A1 B1 C2
Pedal Keyboard

* An 8-feet compass is used for each keyboard.

DISASSEMBLY INSTRUCTIONS

1 Removing the top cover

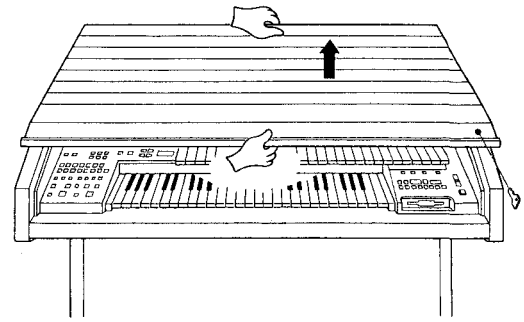
1. Remove the music stand.
2. Remove the top cover holding screws located on the rear board (Ⓐ 4 pcs.).
3. Remove the top cover, sliding it forward and lift.



[Fig. 6]

2 Removing the sliding cover

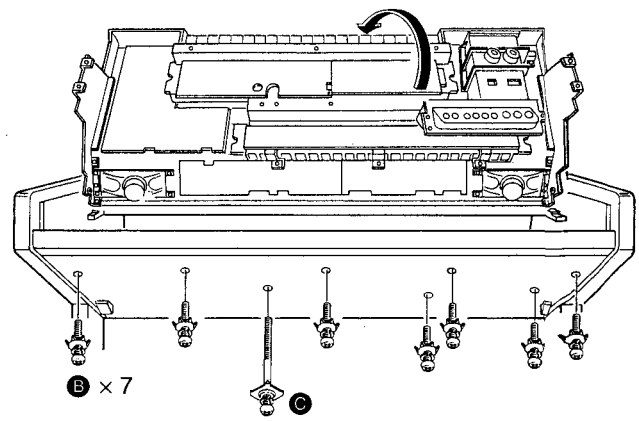
1. Remove the top cover (see step 1.).
2. Unlock the sliding cover with the accessory key.
3. Remove the sliding cover in its fully closed position.



[Fig. 7]

3 Opening the control panel with keyboard unit

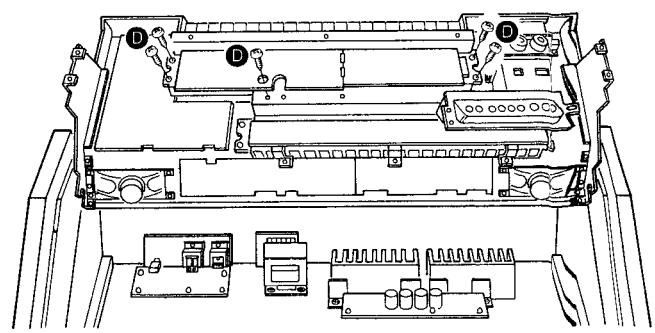
1. Remove both top cover and sliding cover (see steps 1 and 2.).
2. Remove the control panel holding screws located under the upper cabinet (Ⓑ 7 pcs. and Ⓒ 1 pc.).
3. The control panel with keyboard unit can now opened upwards.



[Fig. 8]

4 Removing the lower keyboard

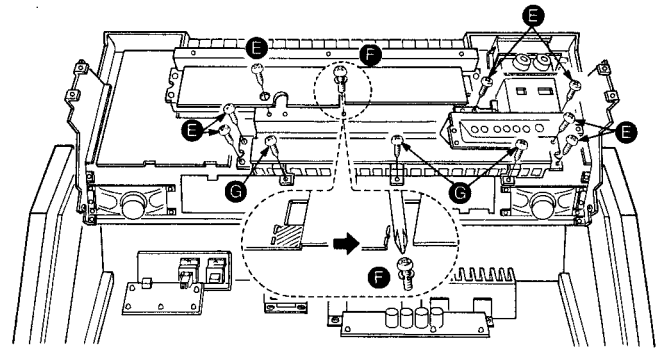
1. Open the control panel with keyboard unit (see step 3.).
2. Remove the connectors on the printed circuit boards.
3. Remove the lower keyboard ass'y holding screws (Ⓓ 5 pcs.).
4. The lower keyboard ass'y can be removed.



[Fig. 9]

5 Removing the upper keyboard

1. Open the control panel with keyboard unit (see step 3.).
2. Remove the connectors on the printed circuit boards.
3. Remove the upper keyboard ass'y holding screws (E 7 pcs. and G 3 pcs.).
4. Bend the printed circuit board along the scored line and remove the screw (F 1 pc.).
5. The upper keyboard ass'y can be removed.

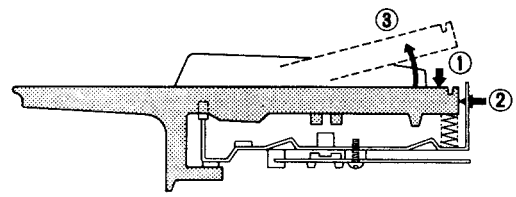


[Fig. 10]

6 Removing the keys

1. Remove the keyboard by following the procedure in step 2.
2. Press downward on the rear of the key (Fig. 11-①).
3. While pressing downward on the rear of the key, push the key forward and release it from the chassis (Fig. 11-②).
4. Lift the key and remove it from the chassis (Fig. 11-③).

NOTE:
To remove a black key, the white key to either side of it should be removed first.



[Fig. 11]

7 Removing the ME and MAIN P.C.B.

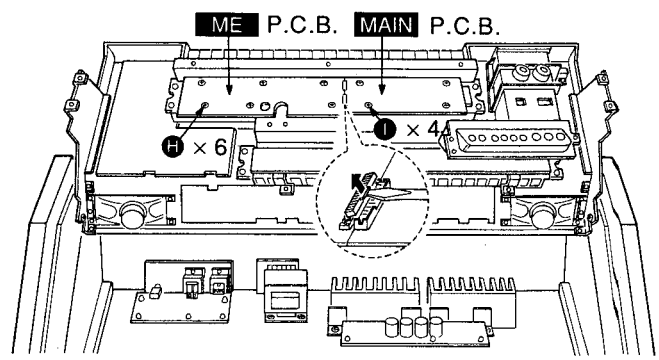
- Open the control panel with keyboard unit (see step 3).

ME P.C.B.

1. Remove the connector which joins the 2 P.C.B.s with a screwdriver as shown in the figure.
2. Remove the ME P.C.B. mounting screws (H 6 pcs.).

MAIN P.C.B.

1. Remove the connector which joins the 2 P.C.B.s with a screwdriver as shown in the figure.
2. Remove the MAIN P.C.B. mounting screws (I 4 pcs.).



[Fig. 12]

8 Removing the ACP and AS P.C.B.

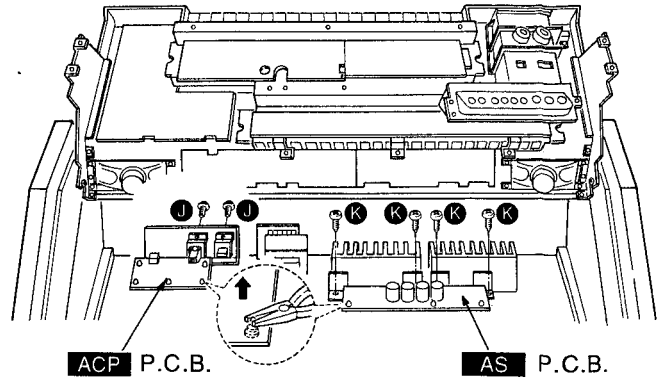
- Open the control panel with keyboard unit (see step 3).

ACP P.C.B.

1. Remove the jack mounting screws on the jack panel (J 2 pcs.).
2. Release the 5 claws of the P.C.B. holder to remove the ACP P.C.B.

AS P.C.B.

1. Remove the AS P.C.B. mounting screws (K 4 pcs.).
2. Release the 3 claws of the P.C.B. holder to remove the AS P.C.B.



[Fig. 13]

9 Removing the JK and FDCN P.C.B.

JK P.C.B.

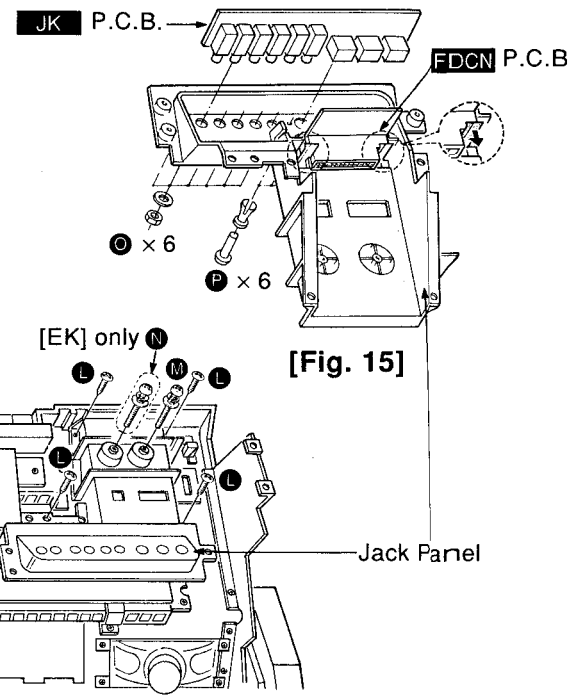
1. Open the control panel with keyboard unit (see step 3).
2. Remove the jack panel mounting screws (L 4 pcs. and M 1 pc.). The jack panel can then be removed.
3. Remove the JK P.C.B. mounting nuts and latches (O 6 pcs. and P 6 pcs.).

FDCN P.C.B.

1. Remove the jack panel by following the steps above.
2. Release the 2 claws holding the FDCN P.C.B. to remove it.

• For the United Kingdom [EK]

1. The Digital Disk Recorder is built in for units sold in the United Kingdom. To remove the Digital Disk Recorder, remove the screw (N 1 pc.).
2. When installing the Digital Disk Recorder, do NOT use a screw at screw position M. If you do so, the unit will be damaged.

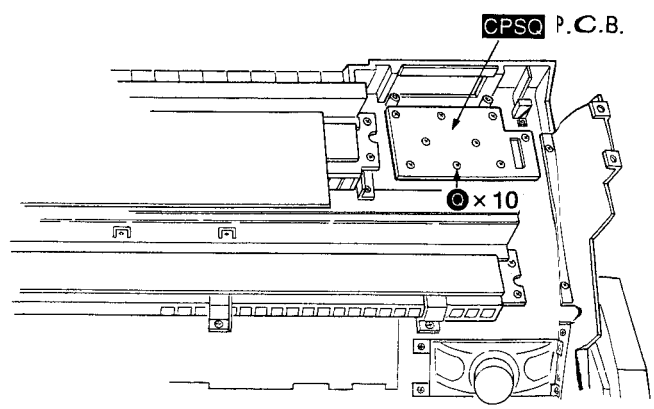


[Fig. 15]

[Fig. 14]

10 Remove the CPSQ P.C.B.

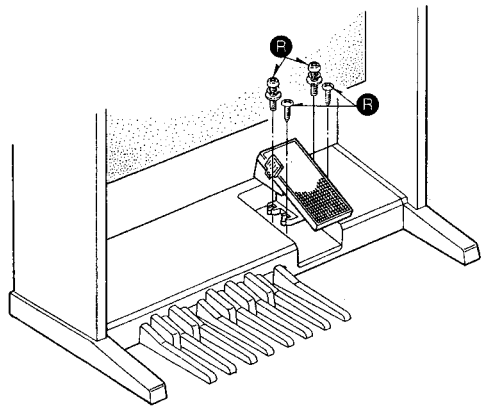
1. Open the control panel with keyboard unit (see step 3).
2. Remove the jack panel (see step 9).
3. Remove the CPSQ P.C.B. mounting screws (O 10 pcs.).



[Fig. 16]

11 Removing the expression pedal

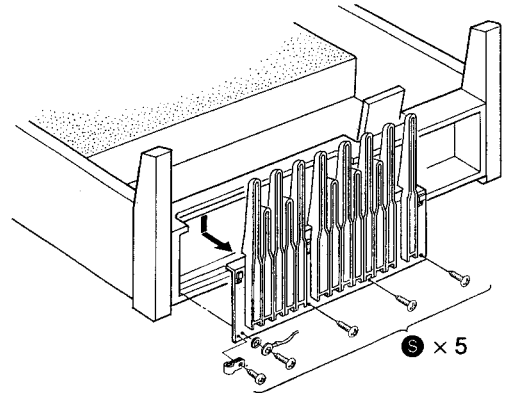
1. Remove the expression pedal mounting screws (R 4 pcs.). The expression pedal can then be removed.



[Fig. 17]

12 Removing the pedal keyboard

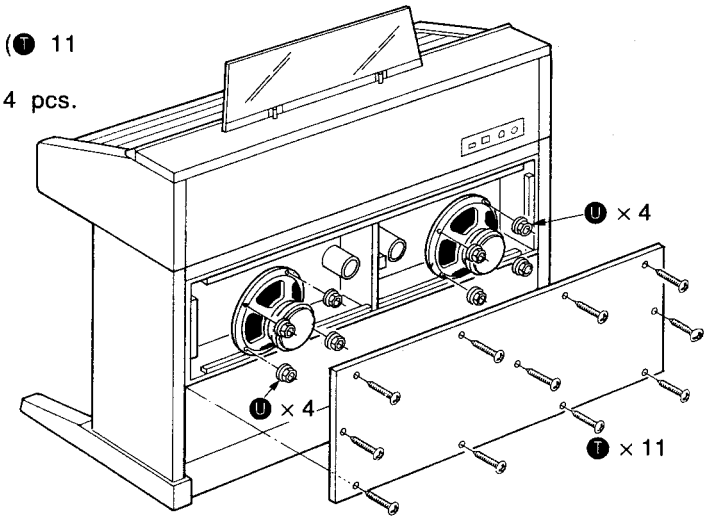
1. Remove the pedal keyboard mounting screws (S 5 pcs.).
2. Remove the pedal keyboard by pulling in the direction indicated by the arrow.



[Fig. 18]

13 Removing the speakers

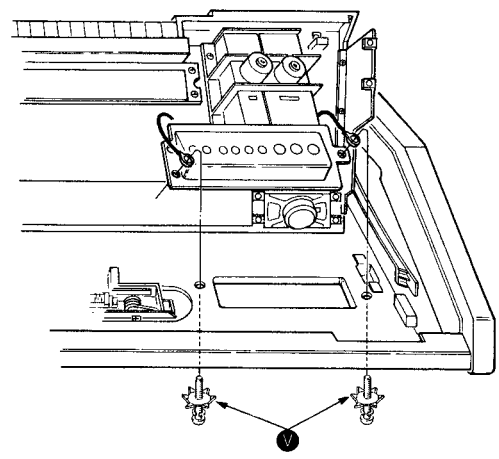
1. Remove the rear board mounting screws (T 11 pcs.).
2. Remove the speaker mounting nuts (U 4 pcs. each), and then remove the speakers.



[Fig. 19]

■ Important: when closing the control panel

- When closing the control panel, make sure that the JK P.C.B. ground wire is in the position shown in Fig. 20 and affix it securely with screws (V 2 pcs.).
- After tightening the screw, please confirm once more that the ground wire is in the proper position.



[Fig. 20]

MEASUREMENTS AND ADJUSTMENTS

■ **Measuring Equipment**

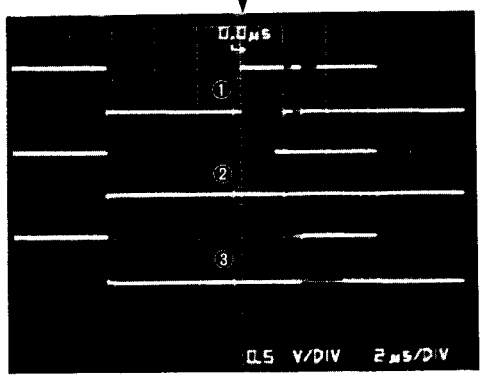
• Oscilloscope 20 MHz, 10:1 probe/1:1 probe

ADJUSTMENT	MEASURING CONDITIONS	EQUIPMENT	ADJUSTMENT P.C.B.	ADJ. POINT	CONNECT POINT(S)	READING
D/A Converter offset	any position	Oscilloscope	MAIN P.C.B.	VR1	Checkpoint Ⓐ	0V ±5 mV

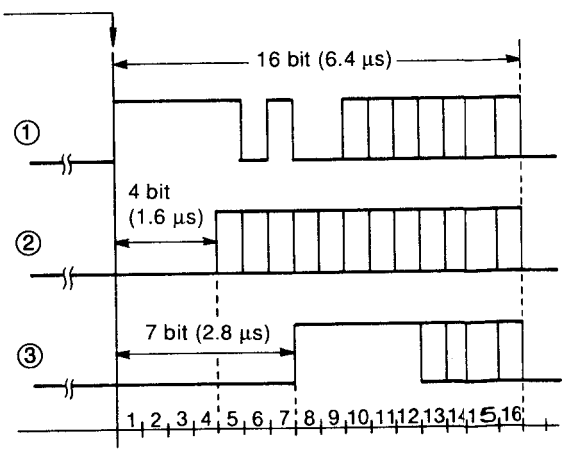
1. Set the oscilloscope voltage division to 5 mV/cm (Use the 1:1 oscilloscope probe) and connect the oscilloscope probe to MAIN P.C.B. Checkpoint Ⓐ.
2. Turn VR1 to adjust the voltage to zero.

DRV bias	any position	Oscilloscope	MAIN P.C.B.	VR2	Checkpoint Ⓑ, Ⓒ	Photo-A Fig. A

1. Connect the oscilloscope channel 1 to MAIN P.C.B. checkpoint Ⓐ and connect the oscilloscope external trigger to MAIN P.C.B. checkpoint Ⓒ. (Set the oscilloscope CH1 triggering with EXT in.)
2. Turn VR2 on the MAIN P.C.B. fully counter-clockwise and set the data starting point to the oscilloscope division scale to facilitate adjustment in next procedure. (See photo A-①.)
3. Confirm that the first 4 bits (or 5 bits) are low when VR2 is turned fully clockwise. (See photo A-②, Fig. A-②.)
4. Gradually turn VR2 counter-clockwise and make the first 7 bits (2.8µs) turn to low. (See photo A-③, Fig. A-③.)



[Photo-A]

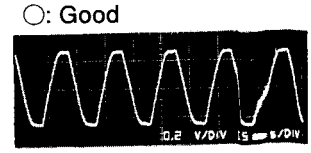


[Fig. A]

BBD Bias	any position	Oscilloscope and oscillator	ME P.C.B.	VR1	IC14-① pin	Photo-B

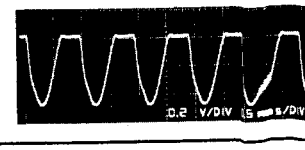
1. Connect the oscilloscope to IC14-① pin of ME circuit board.
2. Input 1 kHz sine wave to IC17-③ pin by oscillator through capacitor of less than 50V 1µF.
   Then, adjust the output level of oscillator until the sine wave on the oscilloscope is clipped.
3. Adjust VR1 so that the output waveforms on the oscilloscope are evenly clipped at top and bottom.

○: Good



[B]

×: Fault



[C]

PRECAUTIONS BEFORE SERVICING

■ Precautions for measuring of the output waveforms.

1. The waveform was measured with a "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of the musical tone signals shown may differ somewhat due to the difference in the timing of the triggering.
2. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform photo is 1/10 of the actual value (e.g. 0.2V/cm should be 2.0V/cm).
3. This Electronic Organ has a touch-sensitive type keyboard. Therefore the touch sensor level must be set to the "0" level when checking waveform measurements after activating the initial setting.
   - Initial setting method
   (1) Turn off the **POWER** button.
   (2) While pressing the three leftmost buttons in the **RHYTHM** section (**8 BEAT**, **ROCK** and **16 BEAT 1**) at the same time, turn the **POWER** button on again.
   - Touch sensitivity setting method
   (1) Press and hold the **TOUCH** button for the **UPPER SOUND SELECT** or **LOWER SOUND SELECT** until the display changes (2 or 3 seconds).
   (2) Use the **TRANSPOSE** buttons to set the touch sensitivity level to "0".

■ Important safety notice:

Components identified by a ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only the manufacturer's specified parts.

■ Symbolic marks

The symbolic marks for resistors and capacitors used in these circuits are classified following TABLE-1 and TABLE-2.

1. RESISTORS
   - Resistors without a symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
   - All resistors are 1/4 WATT, ±5% TOLERANCE unless otherwise designated in the schematic diagrams.

(TABLE-1)

SYMBOL	SPECIFICATION	SYMBOL	SPECIFICATION
Ⓕ	Fixed Carbon Film Resistors "FLAME-PROOF" (ERD__F__type)	Ⓕ	Fixed Metal Film Resistors "FLAME-PROOF" (ERX__type)
Ⓕ	Fixed Wire Wound Resistors "FLAME-PROOF" (ERF__type)	[F]	Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ__type)
Ⓕ	Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG__type)	[F]	Fuse Type Fixed Carbon Film Resistors "FLAME-PROOF" (ERD2FC__type)
Ⓖ	Fixed Metal Film Resistors (Precision and High Stability) (ERO__type)		

2. CAPACITORS
   - Capacitors without a symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, ±10% Tolerance)
   - Polarized capacitors without a symbolic mark are Aluminum Electrolytic Capacitors. (ECEA-type,±20% Tolerance)

(TABLE-2)

SYMBOL	SPECIFICATION	TYPE
Ⓝ	Non-Polarized Electrolytic Capacitors	ECEA__KN__type
Ⓨ	Non-Polarized Electrolytic (for Network System)	ECEA__Y__type
Ⓜ	Aluminum Electrolytic Capacitors (Low leakage current type)	ECEA__M__type
Ⓩ	Aluminum Electrolytic Capacitors (Low impedance type)	ECEA__Z__type
Ⓣ	Tantalum Solid Electrolytic Capacitors	ECS__type
ⓉⒻ	Metalized Plastic Film Capacitors (TF Series)	ECQV__type
	Polyester Film Capacitors	ECQB__type
○	Temperature Compensating Ceramic Capacitors	ECC__type
	High-Dielectric Constant Ceramic Capacitors	ECK__type ECR__type
	Ceramic Capacitors (Cylinder type)	ECBA__type
	Metalized Polyester Film Capacitors for Across the Line	ECQ__EW__type
	Aluminum Electrolytic Capacitors for Smoothing Circuit	ECES__type

ERROR DISPLAY

The following messages on the display indicate that a mistake has been made in using the functions.

Display	Remedy
oth Fd	The memory disk has not been formatted by the Digital Disk Recorder. • Insert a correctly formatted disk.
L Err	Loading failure. • Perform the loading procedure again.
no Fd	No memory disk in the Digital Disk Recorder. • Insert a memory disk.
no SnG	You have attempted to load a song number which has not been saved. • Load a song number which has been saved.
no ddr	No Digital Disk Recorder.
S Err	Saving failure. • Perform the saving procedure again.
Prt Er	The memory disk is write-protected. • Close the write-protect window of the disk.
Fd FUL	No remaining memory storage capacity. • Insert a new disk, and perform the save procedure after formatting it.
F Err	Formatting failure. • Perform the formatting procedure again.
P Err 1	You have attempted to save a song which is copy-protected. • A copy-protected song cannot be saved.

Warning:

- Some pre-recorded disks (for example, those recorded by the manufacturer) are copy-protected. Data from these disks cannot be copied.
- When the power is turned off after a copy-protected song has been loaded, the **SEQUENCER** contents will be erased.
- If a copy-protected song has been loaded and you want to then record a new song in the **SEQUENCER** and save it on a disk, be sure to first turn the power off once or perform the initialization procedure.

SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

The following changes in performance may occur in the Technics Organ but do not indicate trouble.

	Symptom	Remedy
Sounds and effects	The buttons, keys, etc. malfunction.	• Turn off the **POWER** button once, then turn it on again. If this procedure is not successful, turn off the **POWER** button once. Then, while pressing the three lower left buttons in the **RHYTHM** section at the same time, turn the **POWER** button on again. (Note that, in this case, all programmable settings, functions and memories return to their factory-preset status.)
	No sound is produced when the keys are pressed.	• The **MAIN VOLUME** is at the minimum setting. Adjust the volume with the **MAIN VOLUME** control. • The **DEMO** button is on. ("– – –" is shown on the display.) Press the **DEMO** button to turn it off. The display returns to the normal performance display. • The volumes for the selected parts are set to the minimum levels. Use the **VOLUME** buttons to set the volumes of the relevant parts to appropriate levels. • The **LOCAL CONTROL** for a part performed on the keyboard is set to OFF. Set the **LOCAL CONTROL** to on.
	Only percussive instrument sounds are produced when the lower keyboard is played.	• The **KEYBOARD PERCUSSION** button is on. Turn it off to return the keyboard to the normal sound.
	When the **TAB & ORGAN** is selected, it does not sound.	• If all the **FLUTE** and **PERC** buttons are off while the **TAB (FLUTE)** is selected, it does not sound. Turn on a **FLUTE** or **PERC** button to select the sound.
	The sound of the lower keyboard or pedal keyboard does not stop.	• This occurs if the lower keyboard is played when the **FINGERED 1** or **2** and the **MEMORY** buttons are on. Turn off the **MEMORY** button.
	The foot switch does not operate properly.	• Any function is storable in the foot switch. The default setting is for the glide control. Store your favorite function.
Rhythm	The rhythm does not start.	• The **DRUMS** volume is set to the minimum level. Use the **VOLUME** buttons to set the **DRUMS** volume to an appropriate level. • The **MIDI CLOCK** is set the external clock (ON). Set the **MIDI CLOCK** to the internal clock (OFF). • In the **RHYTHM** section, a **COMPOSER** number button with no stored pattern was selected. Change the rhythm or store a new rhythm pattern in the **COMPOSER**.
AUTO PLAY CHORD	No sound is produced for the automatic accompaniment, or only the sounds of some parts are produced.	• An **ACCOMP** part does not sound if its corresponding volume is set to the minimum level. Use the **VOLUME** buttons to set the **ACCOMP** volume to appropriate levels.
	No sound is produced for the automatic accompaniment.	• In the **RHYTHM** section, a **COMPOSER** number button with no stored pattern was selected. Change the rhythm or store a new rhythm pattern in the **COMPOSER**.

	Symptom	Remedy
SEQUENCER	Storage is not possible.	• The remaining memory capacity of the **SEQUENCER** is 0. Follow the **SONG CLEAR** or **TRACK CLEAR** procedure to erase the memory.
	Multi-track storage is not possible.	• The playback track has been selected, but the **START/STOP** button has not been pressed. A flashing track indicator shows the track which is ready for recording, and a lit track indicator shows a track which is ready for playback. To record one track while listening to another (playback) track, press the **START/STOP** button to begin playback.
COMPOSER	Storage is not possible.	• The remaining memory capacity of the **COMPOSER** is 0. Erase a different **COMPOSER** number button in the **RHYTHM** section in which a pattern is stored.
	Setting the time signature and number of measures is not possible.	• The time signature and number of measures cannot be changed for a pattern which is currently recorded in the **COMPOSER**. If you wish to change the time signature and/or measure data, first follow the procedure to clear the memory.
	The playback timing of the rhythm pattern is different from the timing with which it was recorded.	• The **QUANTIZE** function was on when the pattern was recorded and the timing was automatically corrected. Set the **QUANTIZE** level to a smaller note unit or to OFF when recording.
Digital Disk Recorder (Option)	The Digital Disk Recorder produces a noise during recording or playback.	• This occurs when the Digital Disk Recorder is reading a disk. It does not indicate a problem.
	When the procedure to load from a memory disk is performed, the contents of the **SEQUENCER** memory are erased.	• When performing the load operation from a memory disk, the **SEQUENCER** memory changes to that of the data loaded from the memory disk. If you wish to preserve a song which is stored in the **SEQUENCER** memory, save it in a memory disk before performing the load procedure.

MIDI IMPLEMENTATION CHART

Organ

[SX-EN1/EN2/EN3/EN4] **(Transmitted)**

Function		UPPER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN1/EN4)	LOWER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN4)	ACCOMP 1, 2, 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1 (POLY), 4 (SOLO) 1~16	2 1~16	5 (1), 9 (2), 10 (3) 1~16	3 1~16	15 1~16	16 1~16	(EN1) memorized (EN2/EN3/EN4)
	Changed	× 1~16	× 1~16	× 1~16	× 1~16	× 1~16	× 1~16	(EN1) (EN2/EN3/EN4)
Mode	Default	3	3	3	3	3	3	OMNI OFF, POLY MODE
	Messages	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	
Note Number		0~127	0~127	0~127	0~127	0~127	—	Changes depending on the position of the transpose control and octave shift.
	True voice	—	—	—	—	—	—	
Velocity	Note ON	× ○	× ○	○* ○***	○* ○***	○* ○	—	(EN1) (EN2/EN3/EN4)
	Note OFF	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	—	
After Touch	Key's	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	
Pitch Bender		○*	○*	○*	○*	×	×	
Control Change	1	×	×	○*	○*	×	×	modulation
	7	○	○	○	○	○	○	volume (main volume)
	11	×	×	×	×	×	○	expression pedal
	64	○	○	○	○	×	×	sustain
	80	×	○**	×	×	×	×	auto play chord
	82	×	×	×	×	○	×	intro, fill in, ending
	92	○**	○**	×	×	×	×	tremolo
	94	○	○	○	○	×	×	effect
Prog Change		○×	○×	○×	○×	○×	×	
	True #	—	—	—	—	—	—	
System exclusive		×						
System common	Song Pos	×						
	Song Sel	× (EN1/EN2) ○× (EN3/EN4)						0~19
	Tune	×						
System Real Time	Clock	○						
	Commands	○×						start/stop, continue
Aux Messages	Local ON/OFF	×	×	×	×	×	—	
	All notes OFF	○	○	○	○	○	—	
	Active Sense	○						
	Reset	×						
Notes	○* ..... AUTO PLAY CHORD pattern only ○** ..... POLY part only ○*** ..... AUTO PLAY CHORD or SEQUENCER PLAY only ○× ..... Whether or not the data for each of these items is transmitted can be set.							

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes

Mode 3: OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

Organ

[SX-EN1/EN2/EN3/EN4] **(Recognized)**

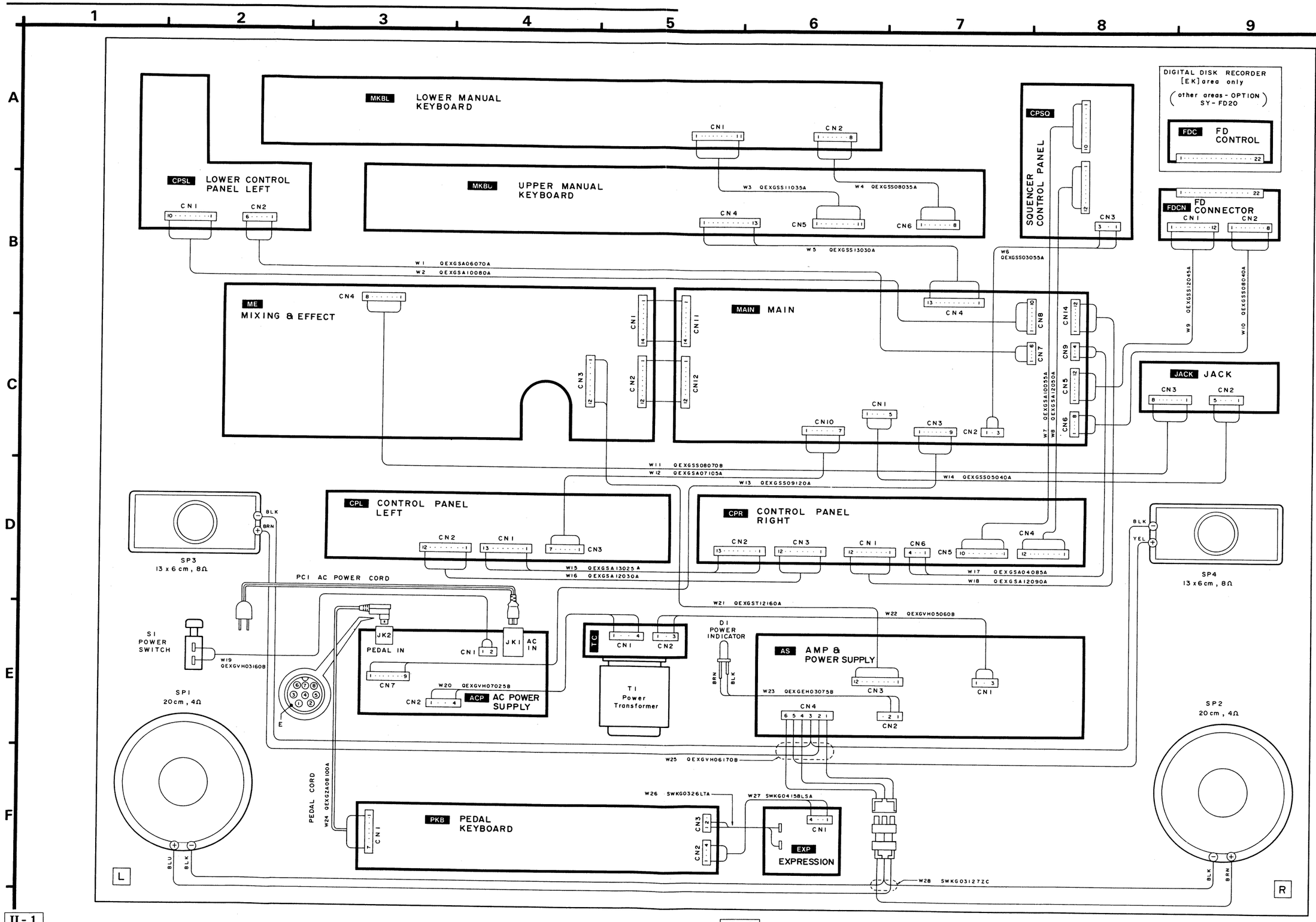
Function		UPPER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN1/EN4)	LOWER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN4)	ACCOMP 1, 2, 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1 (POLY), 4 (SOLO) 1~16	2 1~16	5 (1), 9 (2), 10 (3) 1~16	3 1~16	15 1~16	16 1~16	(EN1) memorized (EN2/EN3/EN4)
	Changed	× 1~16	× 1~16	× 1~16	× 1~16	× 1~16	× 1~16	(EN1) (EN2/EN3/EN4)
Mode	Default	3	3	3	3	3	3	OMNI OFF, POLY MODE
	Messages	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	
Note Number		0~127	0~127	0~127	0~127	0~127	—	Changes depending on the position of the transpose control and octave shift.
	True voice	0~127	0~127	0~127	0~127	48~81	—	
Velocity	Note ON	○	○	○	○	○	—	
	Note OFF	×	×	×	×	×	—	
After Touch	Key's	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	
Pitch Bender		○	○	○	○	×	×	
Control Change	1	○	○	× (EN1/EN2) ○* (EN3/EN4)	× (EN1/EN2) ○* (EN3/EN4)	×	×	modulation
	7	○	○	○	○	○	○	volume (main volume)
	11	×	×	×	×	×	○	expression pedal
	64	○	○	○	○	×	×	sustain
	80	×	○**	×	×	×	×	auto play chord
	82	×	×	×	×	○	×	intro, fill in, ending
	92	○**	○**	×	×	×	×	tremolo
	94	○	○	○	○	×	×	effect
Prog Change		○× 0~9 0~9 0~13	○× 0~7 0~7 0~9	○× 0~7 0~7 0~9	○× 0~3 0~3 0~4	○× 0~11 0~19 0~21	× —	(EN1/EN2) (EN3) (EN4)
	True #							
System exclusive		×						
System common	Song Pos	×						
	Song Sel	× (EN1/EN2) ○× (EN3/EN4)						0~19
	Tune	×						
System Real Time	Clock	○						
	Commands	○×						start/stop, continue
Aux Messages	Local ON/OFF	×	×	×	×	×	—	
	All notes OFF	○	○	○	○	○	—	
	Active Sense	○						
	Reset	×						
Notes		○*.....AUTO PLAY CHORD pattern only ○**.....POLY part only ○×.....Whether or not the data for each of these items is received can be set.						

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes

Mode 3: OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

MEMO

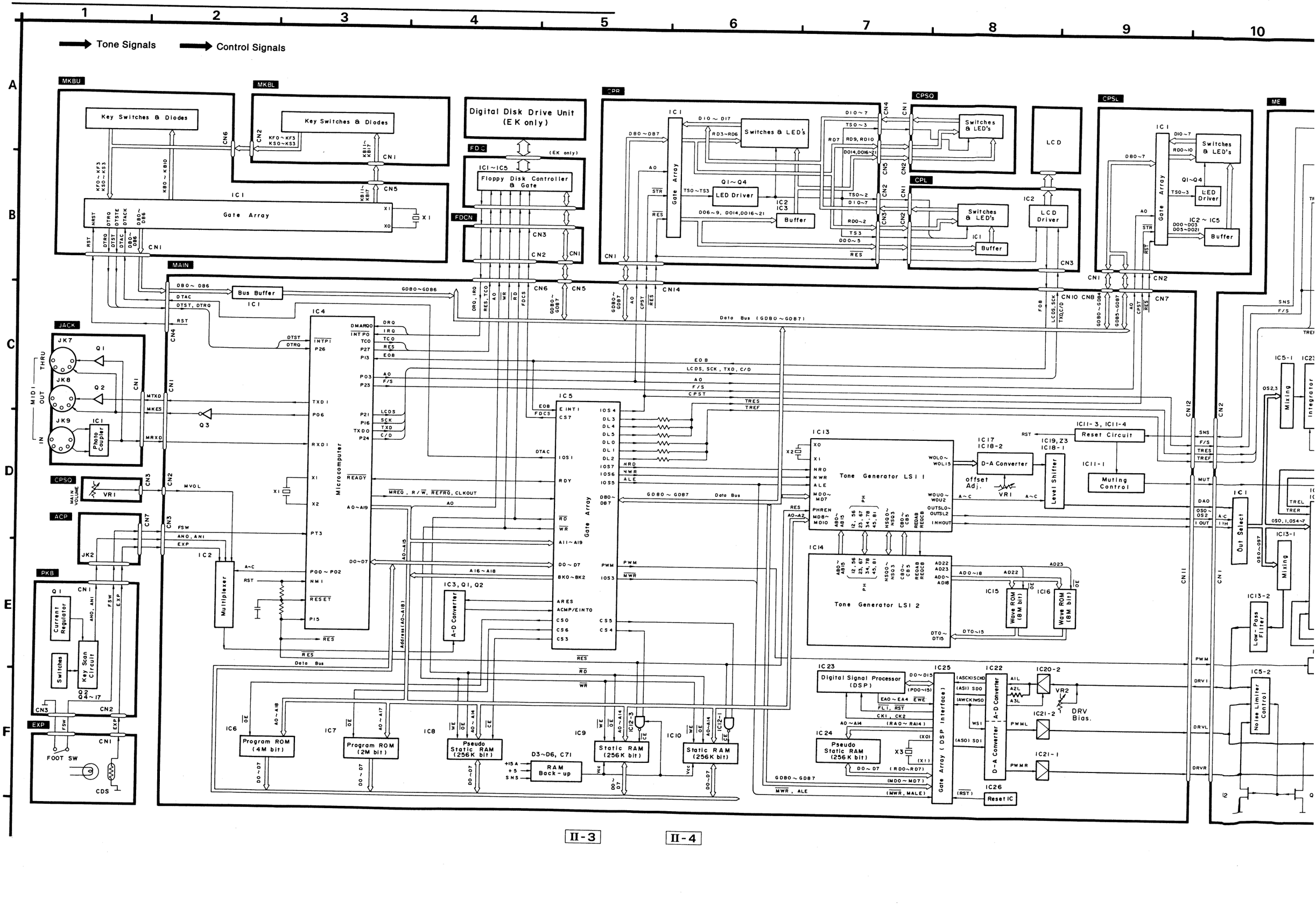
WIRING CONNECTION DIAGRAM

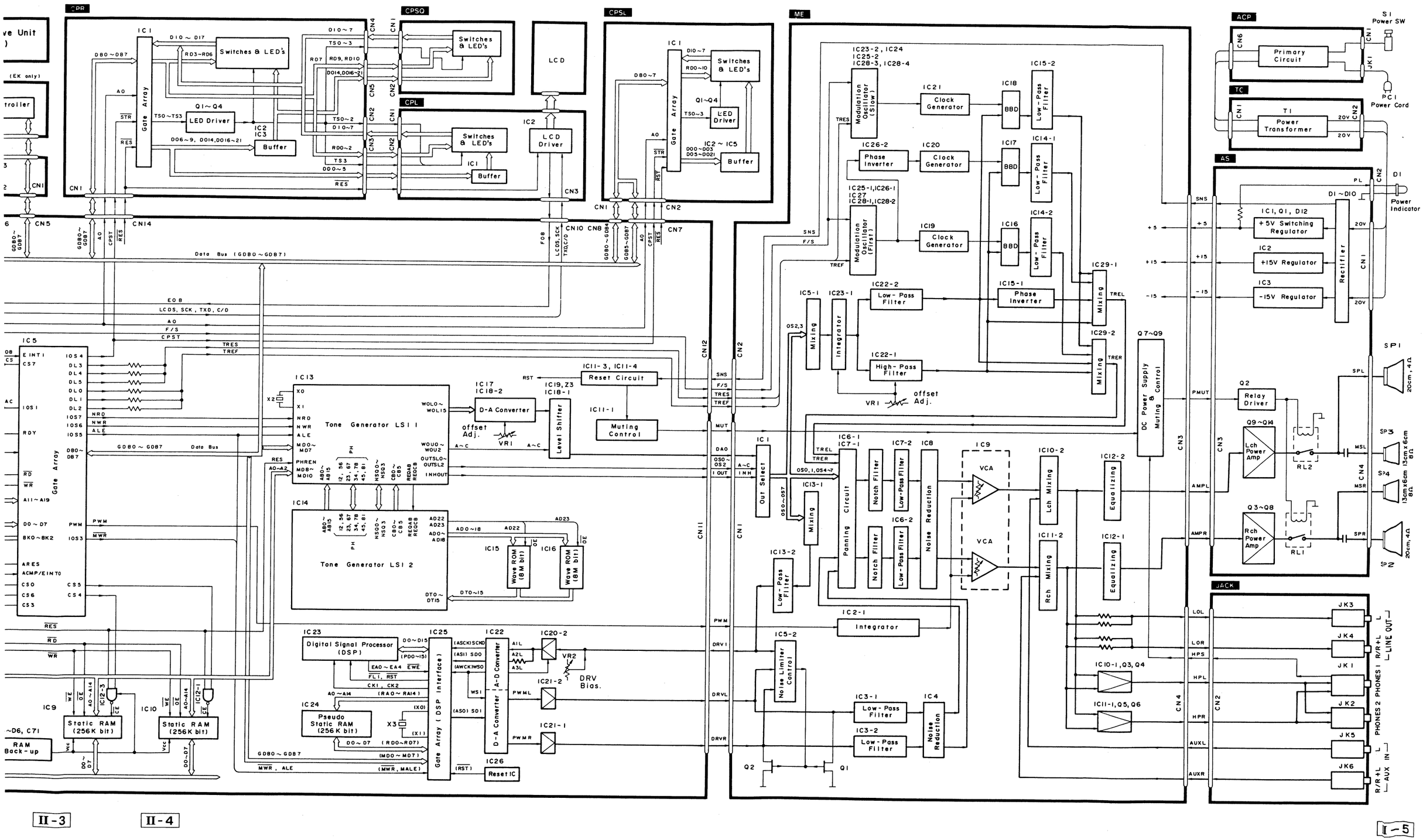


II-1

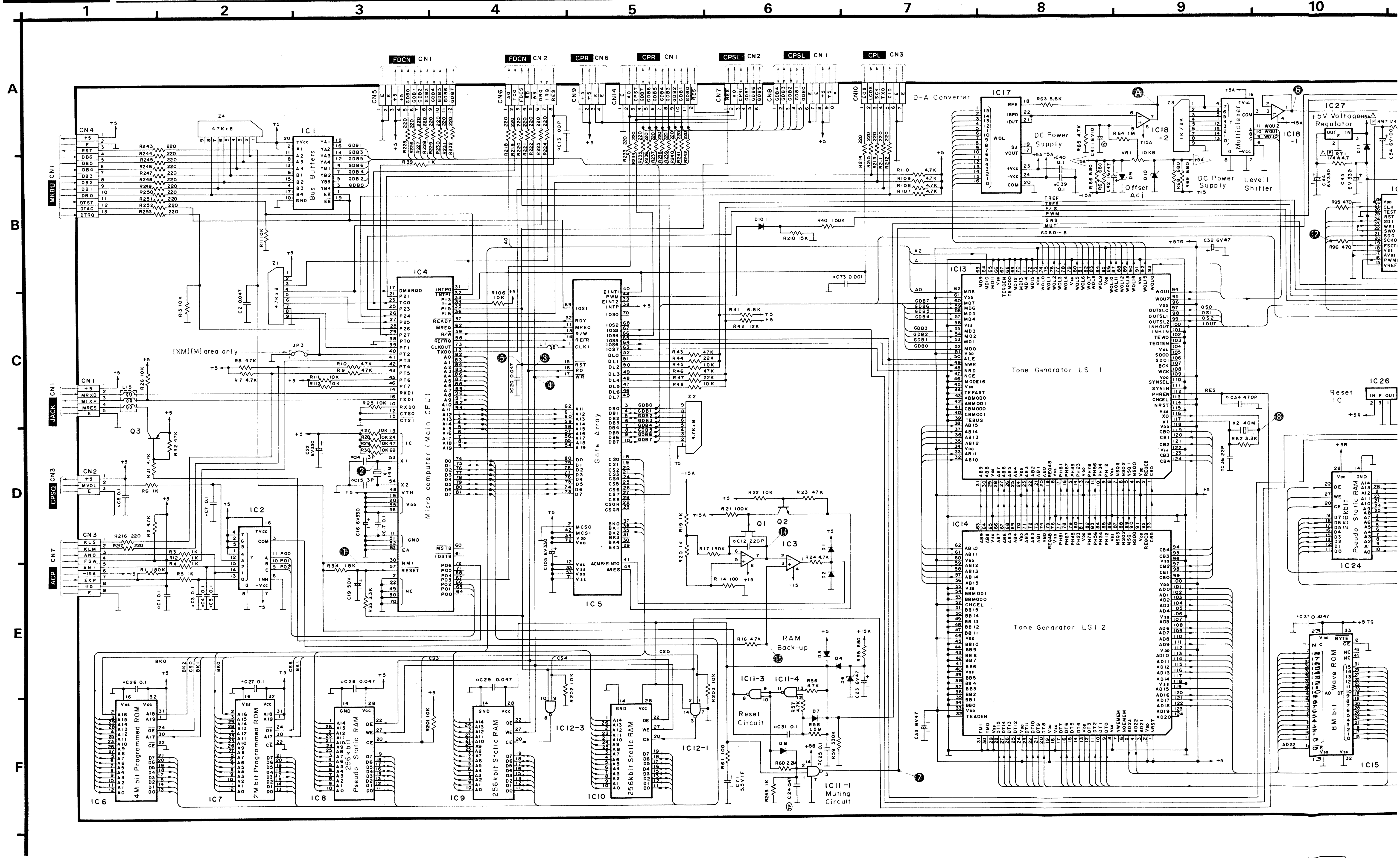
II-2

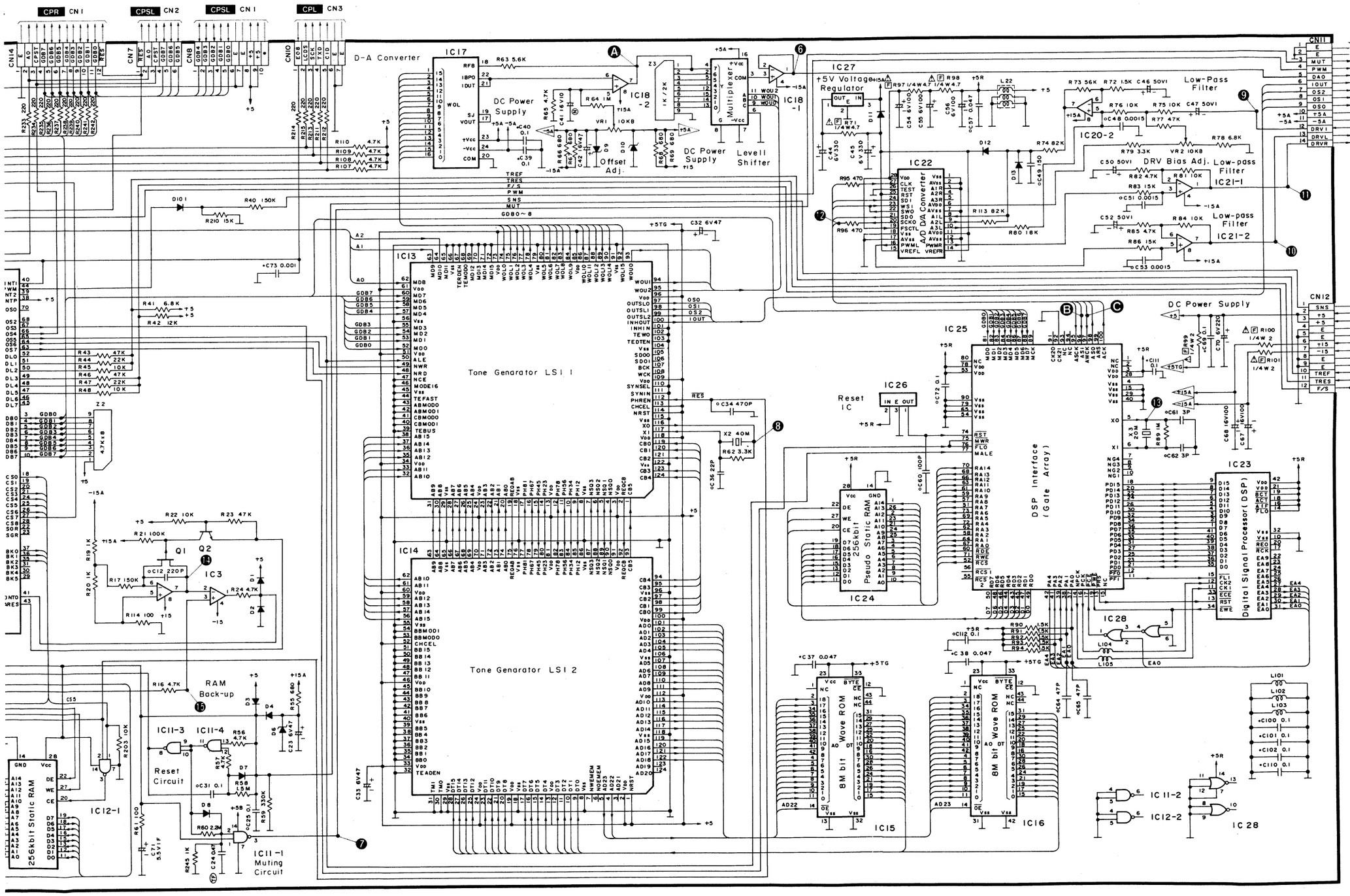
BLOCK DIAGRAM




CPR
CPSQ
CPL
CPSL
ME
ACP
TC
AS
JACK
IC1
Gate Array
Switches & LED's
LED Driver
Buffer
LCD
LCD Driver
Data Bus (GD80~GD87)
IC5
Gate Array
IC13
Tone Generator LSI 1
IC14
Tone Generator LSI 2
IC15
Wave ROM (8M bit)
IC16
Wave ROM (8M bit)
IC9
Static RAM (256K bit)
IC10
Static RAM (256K bit)
IC23
Digital Signal Processor (DSP)
IC24
Pseudo Static RAM (256K bit)
IC25
Gate Array (DSP Interface)
IC22
D-A Converter
IC17
IC18-2
D-A Converter
IC19, Z3
IC18-1
Level Shifter
IC11-3, IC11-4
Reset Circuit
IC11-1
Muting Control
IC26
Reset IC
IC23-2, IC24
IC25-2
IC28-3, IC28-4
Modulation Oscillator (Slow)
IC21
Clock Generator
IC18
BBD
IC15-2
Low-Pass Filter
IC26-2
Phase Inverter
IC20
Clock Generator
IC17
BBD
IC14-1
Low-Pass Filter
IC25-1, IC26-1
IC27
IC28-1, IC28-2
Modulation Oscillator (First)
IC19
Clock Generator
IC16
BBD
IC14-2
Low-Pass Filter
IC15-1
Phase Inverter
IC29-1
Mixing
IC29-2
Mixing
IC5-1
Mixing
IC23-1
Integrator
IC22-2
Low-Pass Filter
IC22-1
High-Pass Filter
VR1
offset Adj.
IC1
Out Select
IC6-1
IC7-1
Panning Circuit
IC7-2
Notch Filter
IC6-2
Notch Filter
IC7-2
Low-Pass Filter
IC6-2
Low-Pass Filter
IC8
Noise Reduction
IC9
VCA
VCA
IC10-2
Lch Mixing
IC11-2
Rch Mixing
IC12-2
Equalizing
IC12-1
Equalizing
IC13-1
Mixing
IC13-2
Low-Pass Filter
IC2-1
Integrator
IC5-2
Noise Limiter Control
IC3-1
Low-Pass Filter
IC3-2
Low-Pass Filter
IC4
Noise Reduction
IC10-1, Q3, Q4
IC11-1, Q5, Q6
Q1
Q2
VR2
DRV Bias.
Primary Circuit
Power Transformer
Power Cord
S1 Power SW
PC1
T1
+5V Switching Regulator
+15V Regulator
-15V Regulator
Rectifier
Power Indicator
DC Power Supply & Muting Control
Q7~Q9
Relay Driver
Q2
Lch Power Amp
Rch Power Amp
Q9~Q14
Q3~Q8
RL2
RL1
SP1
SP2
SP3
SP4
20cm, 4Ω
13cm×6cm 8Ω
JK1
JK2
JK3
JK4
JK5
JK6
LINE OUT
PHONES 2
AUX IN
II-3
II-4
I-5

MAIN CIRCUIT DIAGRAM


IC1 Bus Buffers
IC2
IC3
IC4 Micro computer (Main CPU)
IC5 Gate Array
IC6 4M bit Programmed ROM
IC7 2M bit Programmed ROM
IC8 256kbit Pseudo Static RAM
IC9 256kbit Static RAM
IC10 256kbit Static RAM
IC11-1 Muting Circuit
IC11-3
IC11-4
IC12-1
IC12-3
IC13 Tone Generator LSI 1
IC14 Tone Generator LSI 2
IC15 8M bit Wave ROM
IC17 D-A Converter
IC18-1
IC18-2
IC24 256kbit Pseudo Static RAM
IC26 Reset IC
IC27 +5V Voltage Regulator
Multiplexer
DC Power Supply
Offset Adj.
Level Shifter
Reset Circuit
RAM Back-up
MKBU CN1
JACK CN1
CPSQ CN3
ACP CN7
FDCN CN1
FDCN CN2
CPR CN6
CPR CN1
CPSL CN2
CPSL CN1
CPL CN3
[XM][M] area only



NOTES:

- IC'S

IC1:	M74HC244FP
IC2:	T74H4051AF
IC3:	M5238FP
IC4:	SVIGD70320GJ
IC5:	D65012GF-A79
IC6:	QSIGCEN4AX0
IC7:	QSIGH3C02Z10
IC8:	HM65256BLF10
IC9, 10:	M5256BFP12LL
IC11, 12:	M74HC00FP
IC13:	MN73012PGC
IC14:	MN73013PGD
IC15:	QSIGU3C08802
IC16:	QSIGU3C08801
IC17:	PCM55HP
IC18:	M5238FP
IC19:	T74H4051AF
IC20:	M5220FP
IC21:	M5218AFP
IC22:	MN8305S
IC23:	SVIG87064073
IC24:	HM65256BLF10
IC25:	SVIGMB622416
IC26:	MN1280R
IC27:	SVIGM5278L05
IC28:	M74HC02FP

- TRANSISTORS

Q1:	2SJ105GR
Q2:	2SC1815GR
Q3:	2SA1015-GR

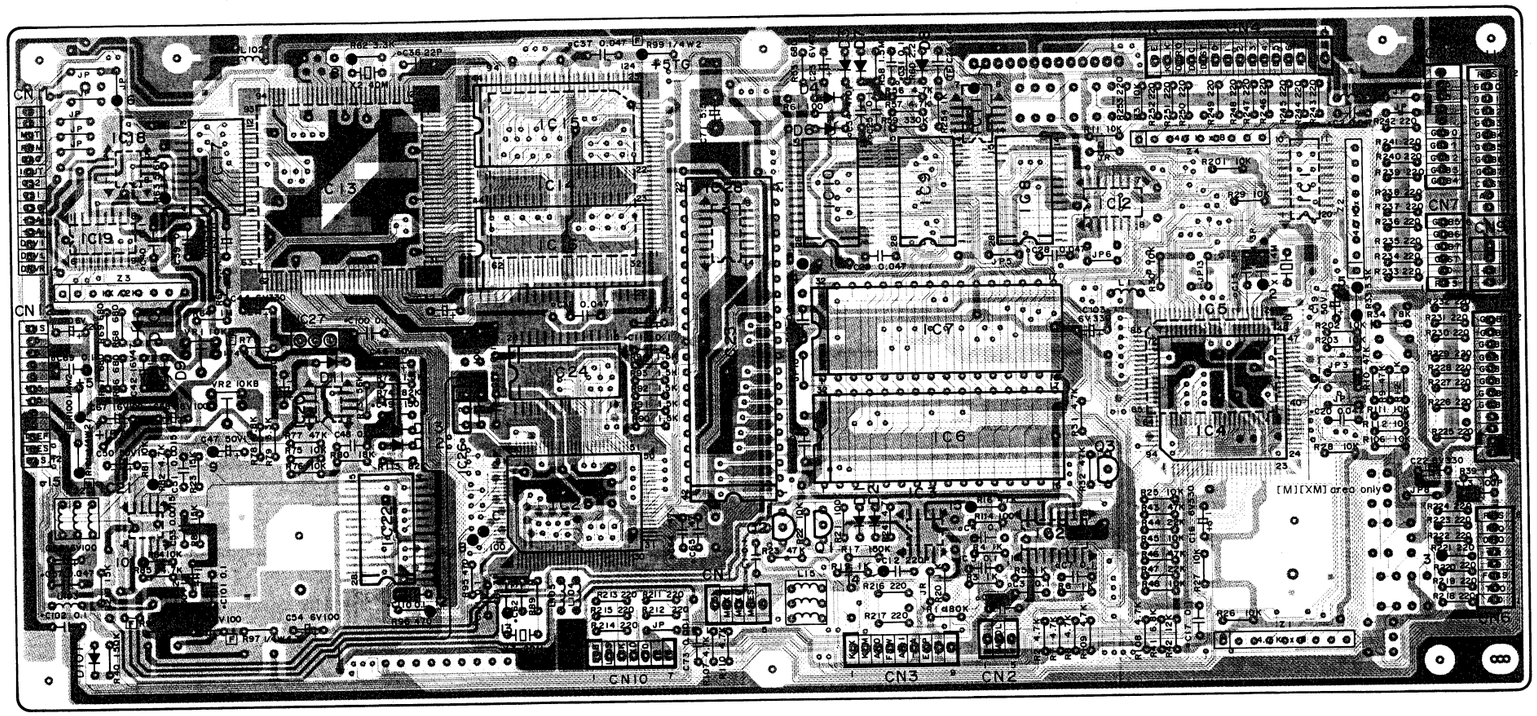
- DIODES

D1~5, 7, 8, 12, 13, 101	: MA165TA5
D6:	MA4051MTA
D9, 10:	MA4056H
D11:	EK04

MAIN CIRCUIT BOARD

• [M][XM] areas **SXPG207331**
• Other areas **SXPG207311**

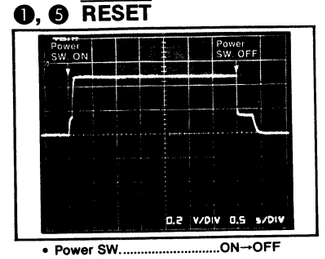
Circuit view on top of P.C.B.



■ Waveform measurement

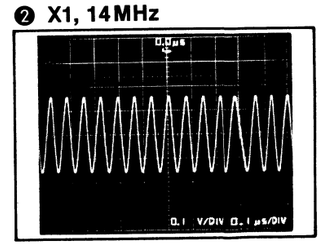
1. Activate the initial setting method. (Refer to page I -15)
2. Set the touch sensitivity level to the "0". (Refer to page I -15)
3. Set the E. organ to required mode followings.
   - UPPER ORCHESTRAL CONDUCTOR.....TAB & ORGAN
   - UPPER TAB & ORGAN .....FLUTE 8'——— ON
     FLUTE 16' 4' 2'——OFF
     TREMOLO———OFF
   - DIGITAL REVERB.....STAGE

❶, ❺ **RESET**

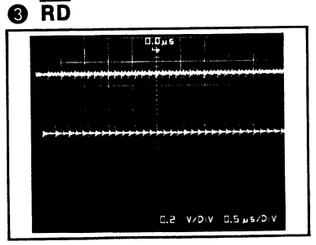


• Power SW.....ON→OFF

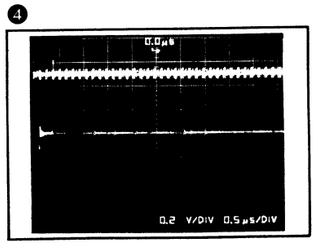
❷ **X1, 14MHz**



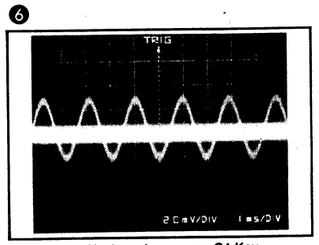
❸ **RD**



❹

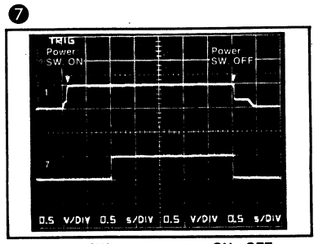


❻



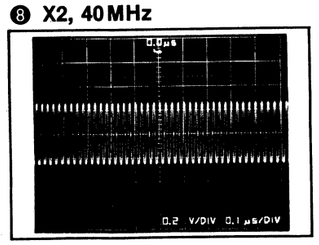
• Upper Keyboard.....C4 Key

❼

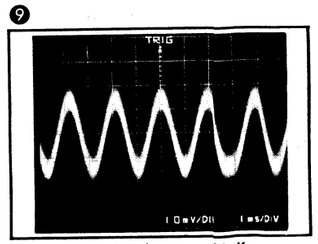


• Power SW.....ON→OFF

❽ **X2, 40MHz**

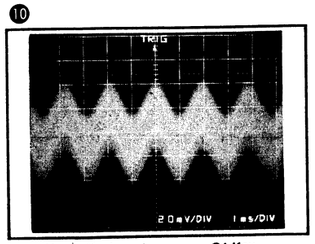


❾



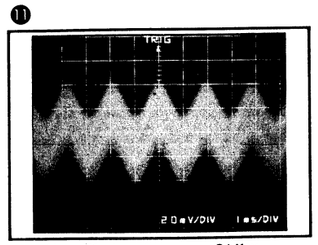
• Upper Keyboard.....C4 Key

❿



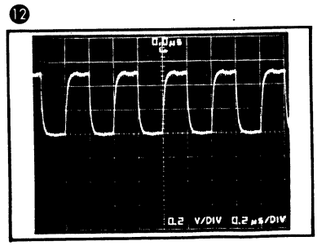
• Upper Keyboard.....C4 Key

⓫

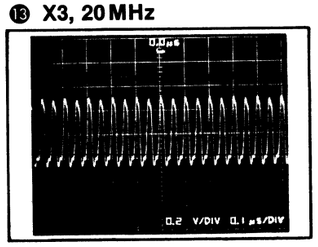


• Upper Keyboard.....C4 Key

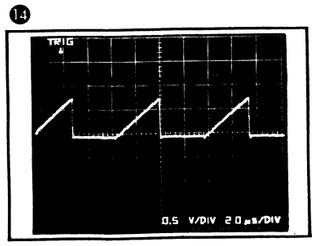
⓬



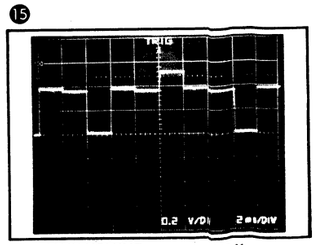
⓭ **X3, 20MHz**



⓮



⓯

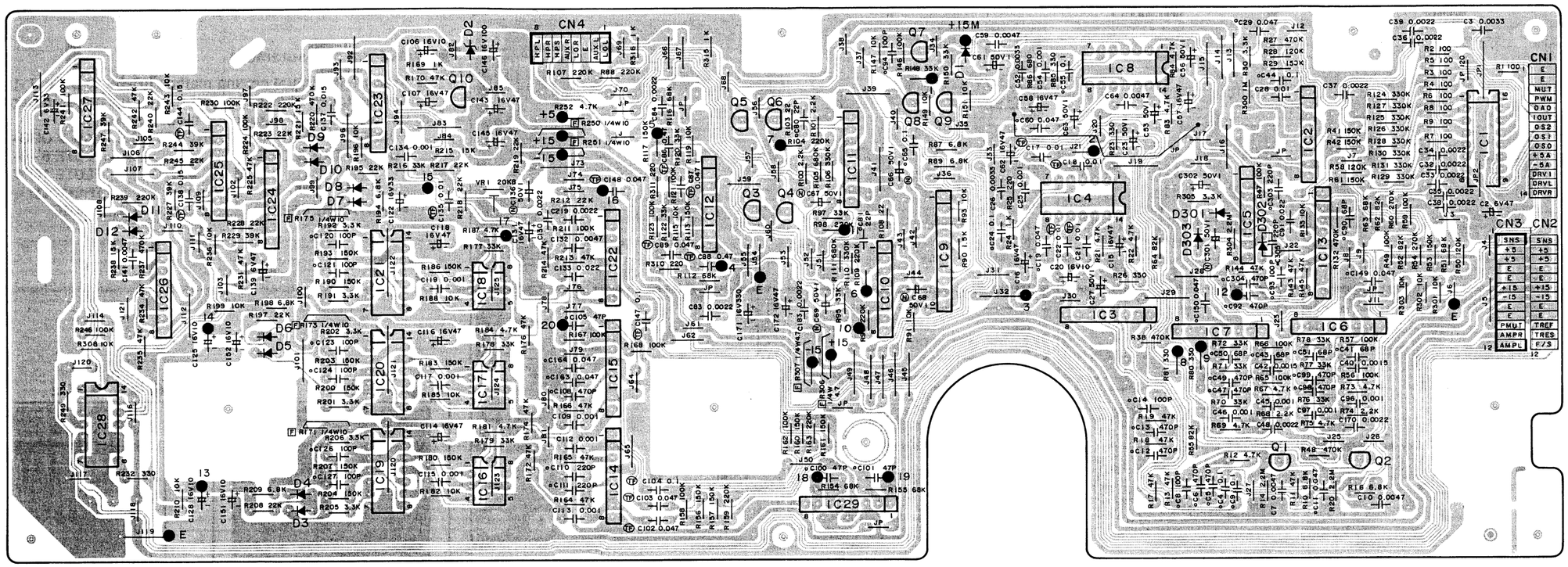


• MAIN VOLUME.....MAX
• EXP. PEDAL.....MAX

ME JACK MIXING & EFFECT AND JACK CIRCUIT BOARD

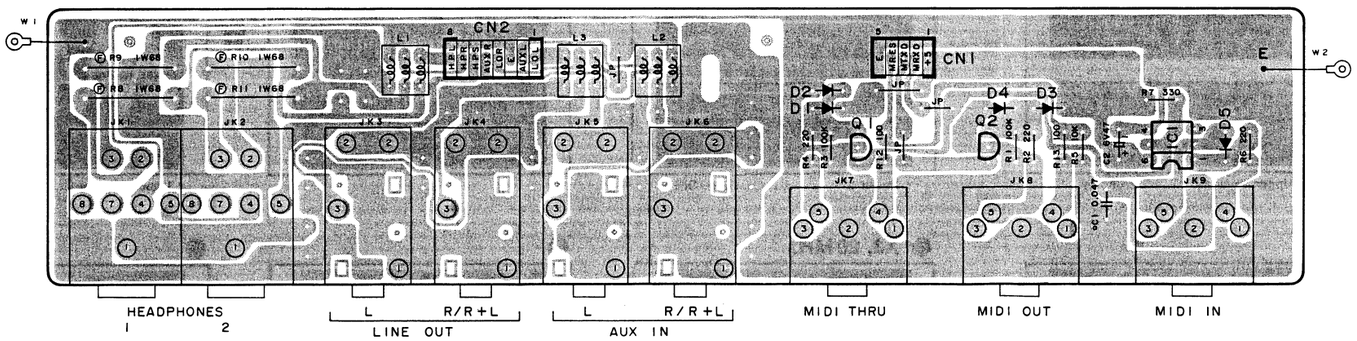
ME

SXPG207511A



JACK

SXPG207511B



JACK

NOTES:

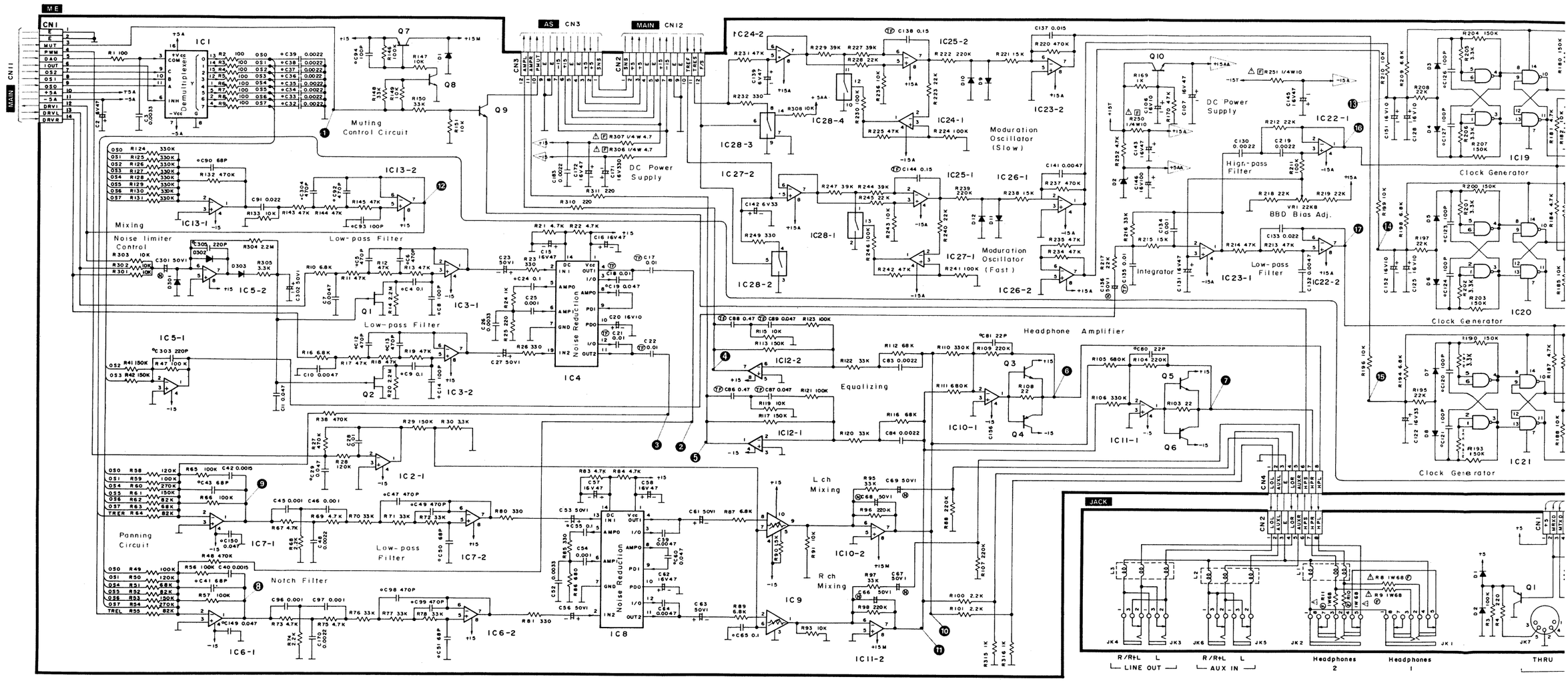
- IC'S
  - IC1: SVIGTLP513
- TRANSISTORS
  - Q1, 2: 2SA1015-GR
- DIODES
  - D1~5: MA165TA5

ME

NOTES:

- IC'S
  - IC1: SVIGT74H4051
  - IC2, 3, 5~7, 10~15, 22~24, 26, 27, 29: SVIGM5218L
  - IC4, 8: SVIGLM1894N
  - IC9: SVIGM5241L
  - IC16~18: MN3009
  - IC19~21: SVIGMSM4011
  - IC25: SVIGM5238L
  - IC28: SVIGM74H4066
- TRANSISTORS
  - Q1, 2: 2SJ105GR
  - Q3: 2SC3940ARS
  - Q4, 6: 2SA1534ARS
  - Q5: 2SC3940ARS
  - Q7: 2SA1015-GR
  - Q8~10: 2SC1815GR
- DIODES
  - D1: EK04
  - D2: MA405MTA
  - D3~12, 302, 303: MA165TA5

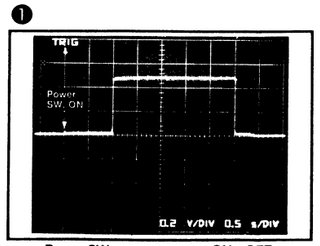
MIXING & EFFECT AND JACK CIRCUIT DIAGRAM



■ Waveform measurement

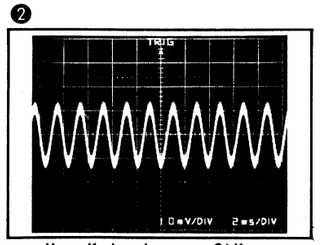
1. Activate the initial setting method. (Refer to page I-15)
2. Set the touch sensitivity level to the "0". (Refer to page I-15)
3. Set the E. organ to required mode followings.
   - UPPER ORCHESTRAL CONDUCTOR.....TAB & ORGAN
   - UPPER TAB & ORGAN .....FLUTE 8'——— ON
     FLUTE 16' 4' 2'——— OFF
     TREMOLO——— OFF
   - DIGITAL REVERB.....STAGE

❶



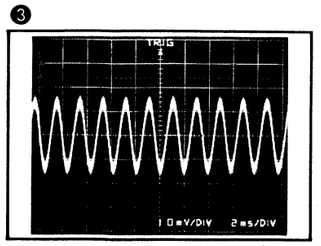
• Power SW.....ON→OFF

❷



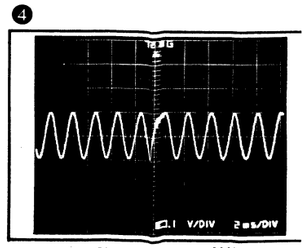
• Upper Keyboard.....C4 Key

❸

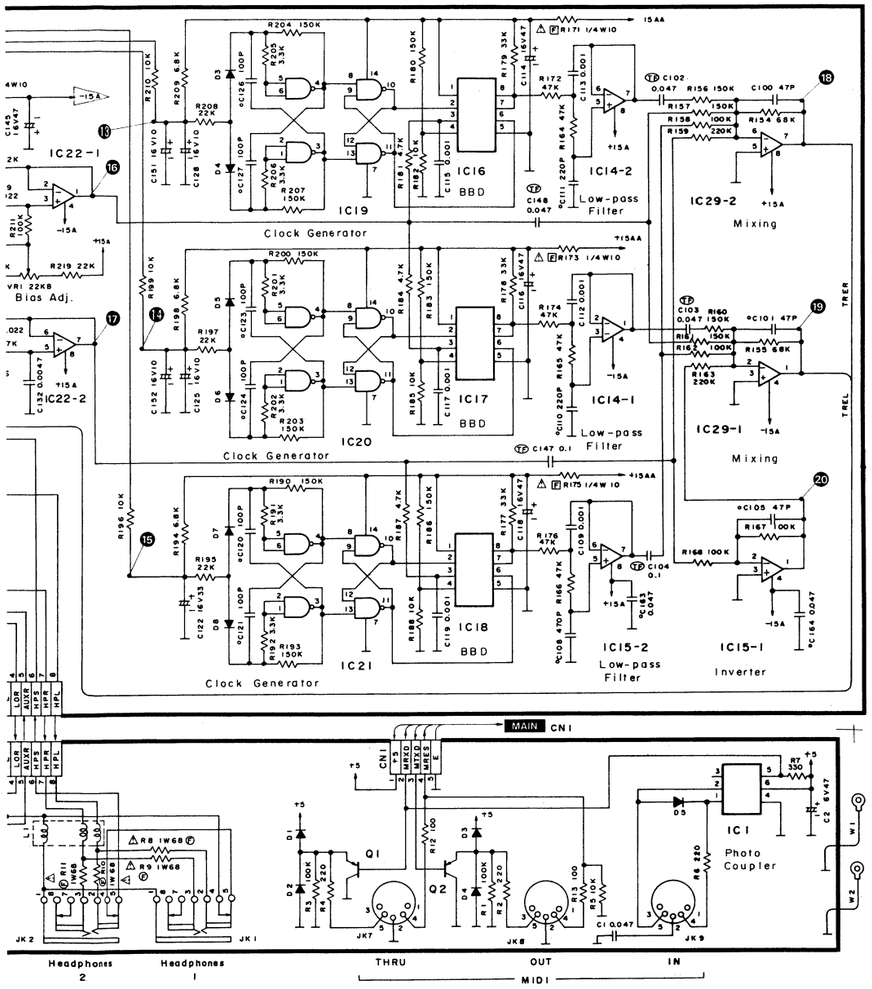


• Upper Keyboard.....C4 Key

❹



• MAIN VOL. .....MAX
• EXP. PEDAL .....MAX
• Upper Keyboard .....C4 Key



ME

NOTES:

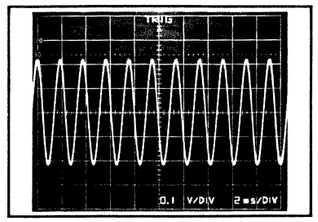
- IC'S
  - IC1: SVIGT74H4051
  - IC2, 3, 5~7, 10~15, 22~24, 26, 27, 29 : SVIGM5218L
  - IC4, 8: SVIGLM1894N
  - IC9: SVIGM5241L
  - IC16~18: MN3009
  - IC19~21: SVIGMSM4011
  - IC25: SVIGM5233L
  - IC28: SVIGM74H4066
- TRANSISTORS
  - Q1, 2: 2SJ105GR
  - Q3: 2SC3940ARS
  - Q4, 6: 2SA1534ARS
  - Q5: 2SC3940ARS
  - Q6: 2SA1534ARS
  - Q7: 2SA1015-GR
  - Q8~10: 2SC1815GR
- DIODES
  - D1: EK04
  - D2: MA4051MTA
  - D3~12, 302, 303 : MA165TA5

JK

NOTES:

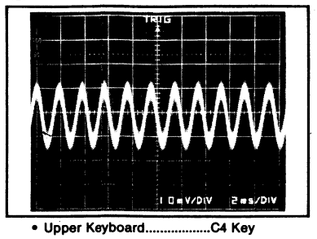
- IC'S
  - IC1: SVIGTLP513
- TRANSISTORS
  - Q1, 2: 2SA1015-GR
- DIODES
  - D1~5: MA165TA5

❼



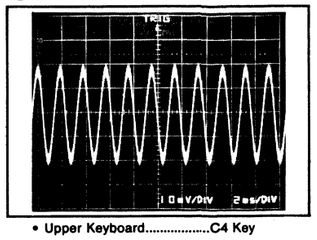
- MAIN VOL. .....MAX
- EXP. PEDAL .....MAX
- Upper Keyboard.....C4 Key

❽



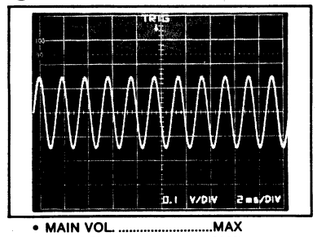
- Upper Keyboard.....C4 Key

❾



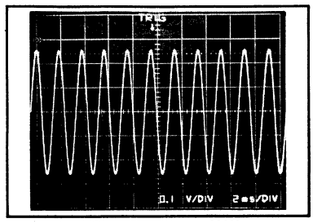
- Upper Keyboard.....C4 Key

❿



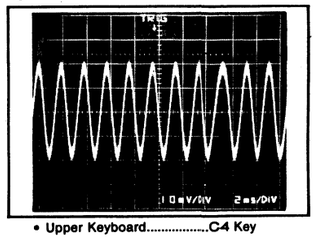
- MAIN VOL. .....MAX
- EXP. PEDAL .....MAX
- Upper Keyboard.....C4 Key

⓫



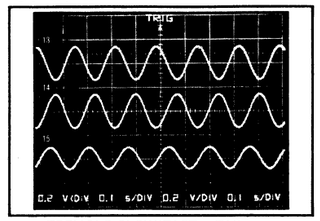
- MAIN VOL. .....MAX
- EXP. PEDAL .....MAX
- Upper Keyboard.....C4 Key

⓬



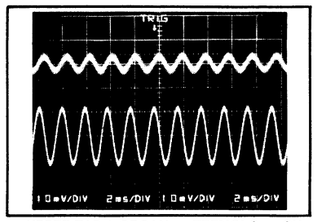
- Upper Keyboard.....C4 Key

⓭, ⓮, ⓯



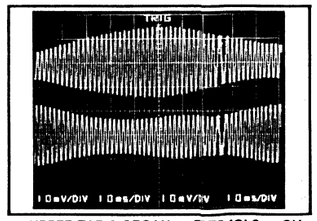
- TREMOLO SLOW/FAST ....FAST

⓰, ⓱



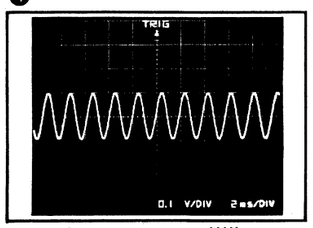
- UPPER TAB & ORGAN .....TREMOLO — ON
- TREMOLO SLOW/FAST ....FAST
- Upper Keyboard.....C4 Key

⓲, ⓳



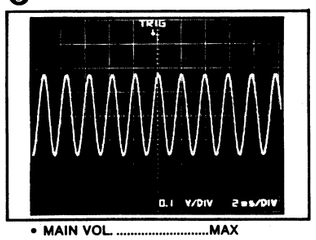
- UPPER TAB & ORGAN .....TREMOLO — ON
- TREMOLO SLOW/FAST ....FAST
- Upper Keyboard.....C4 Key

❹



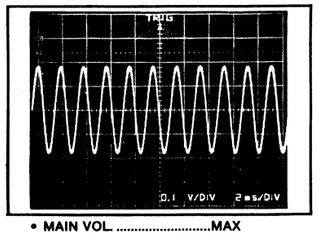
- MAIN VOL. .....MAX
- EXP. PEDAL .....MAX
- Upper Keyboard.....C4 Key

❺



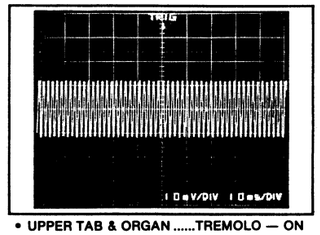
- MAIN VOL. .....MAX
- EXP. PEDAL .....MAX
- Upper Keyboard.....C4 Key

❻



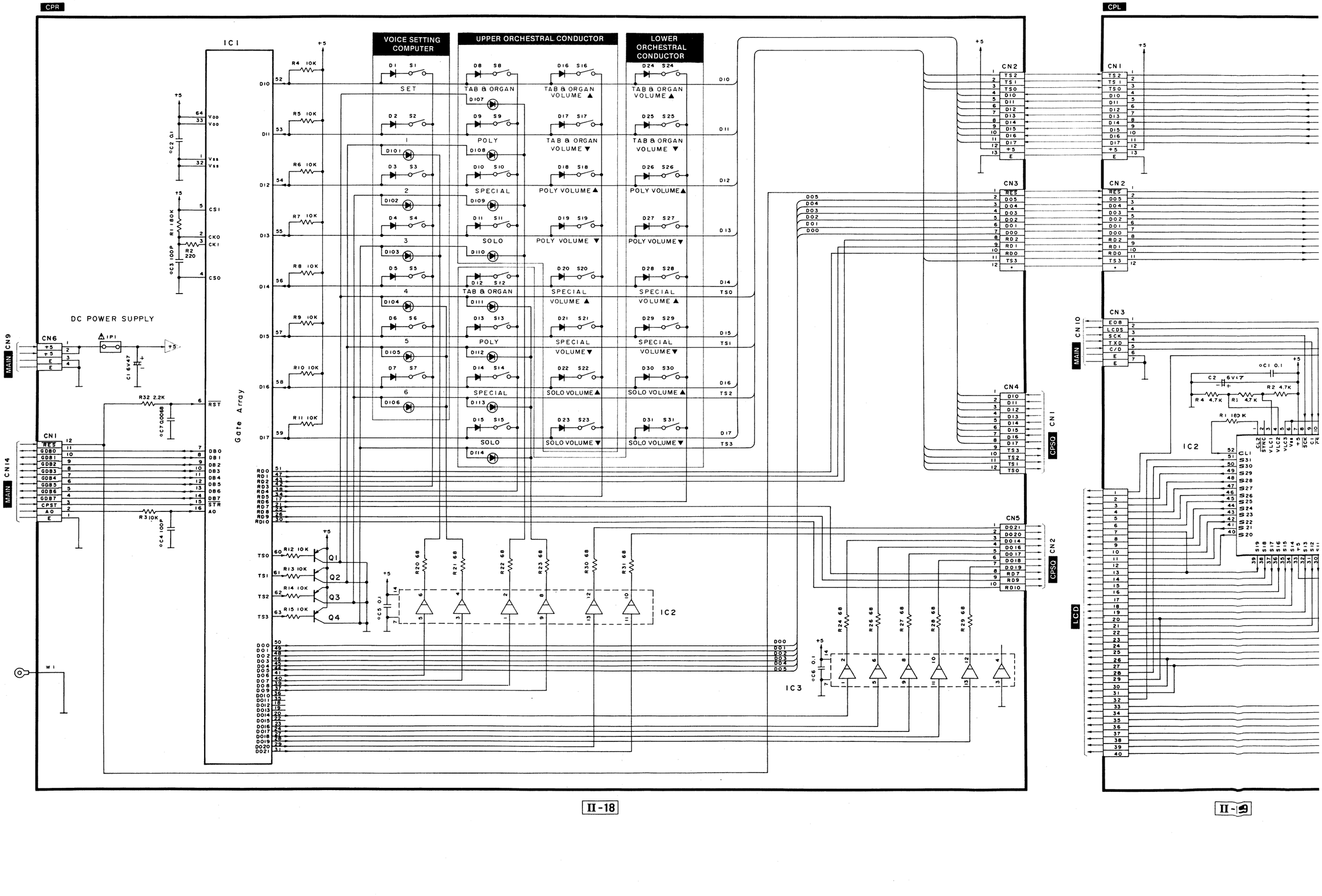
- MAIN VOL. .....MAX
- EXP. PEDAL .....MAX
- Upper Keyboard .... C4 Key

⓴



- UPPER TAB & ORGAN .....TREMOLO — ON
- TREMOLO SLOW/FAST ....FAST
- Upper Keyboard.....C4 Key

UPPER CONTROL PANEL RIGHT, LEFT AND SEQUENCER CONTROL CIRCUIT DIAGRAM



UPPER TAB & ORGAN

LOWER TAB & ORGAN

TEMPO/ PROGRAM

TRANSPOSE

IC1

IC2

CPSQ

CN1

CN2

CN3

CN4

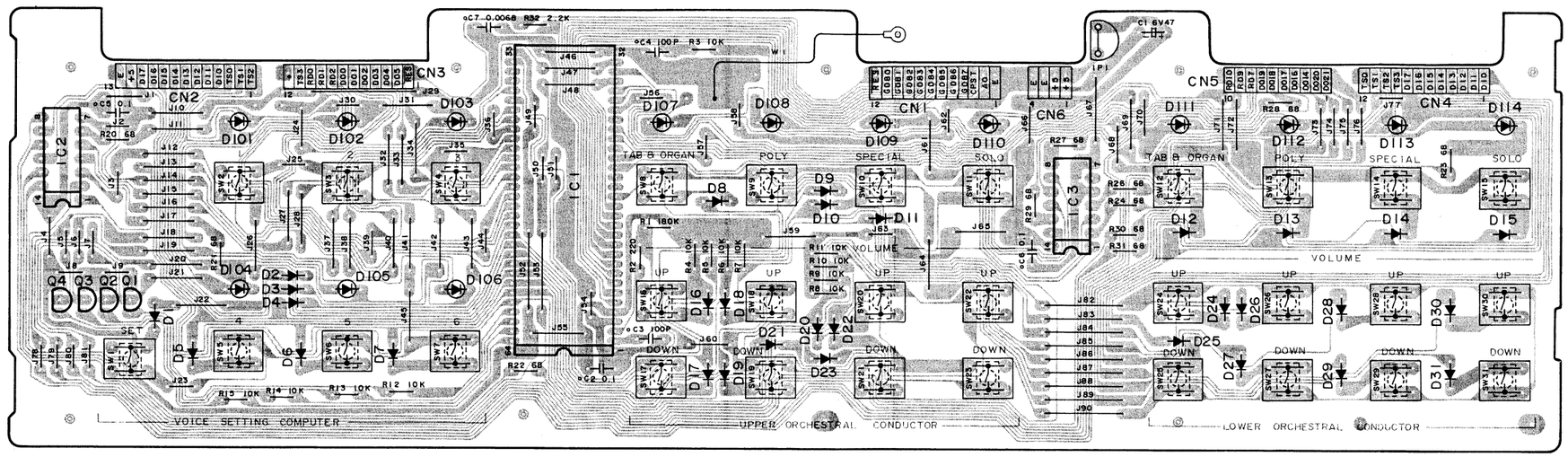
CN5

MAIN VOLUME

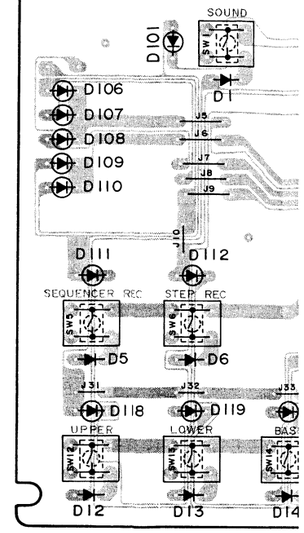
UPPER CONTROL PANEL RIGHT, LEFT & SEQUENCER CONTROL CIRCUIT BOARD

CPR

SXPG207411B



CPSQ

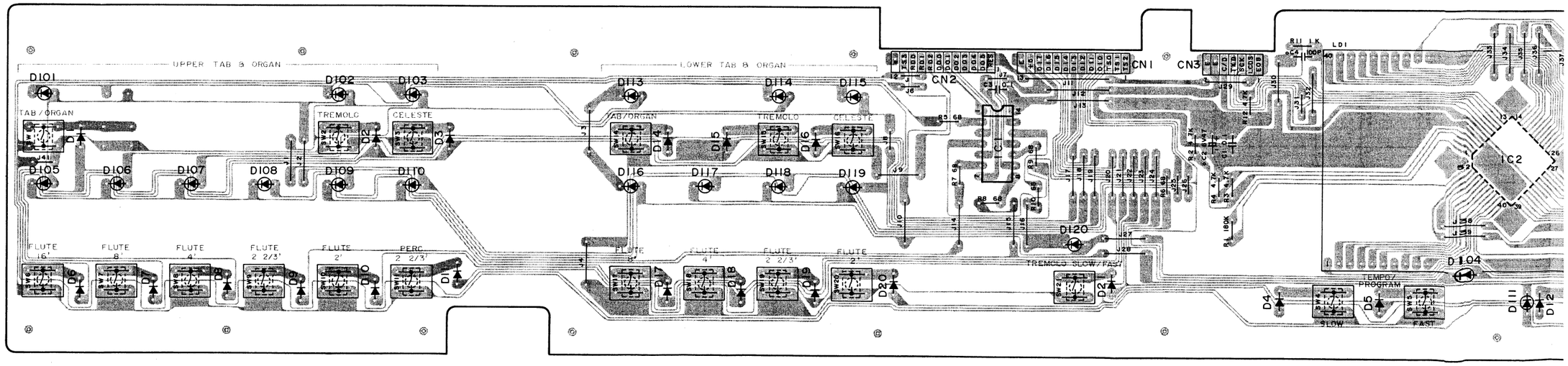


CPR

NOTES:

- IC'S
  - IC1: SVIGM603A121
  - IC2, 3: HD74LS07P
- TRANSISTORS
  - Q1~4: 2SA830SB
- DIODES
  - D1~31: MA165TA5
  - D101~106: LN382G
  - D107~114: LN282R

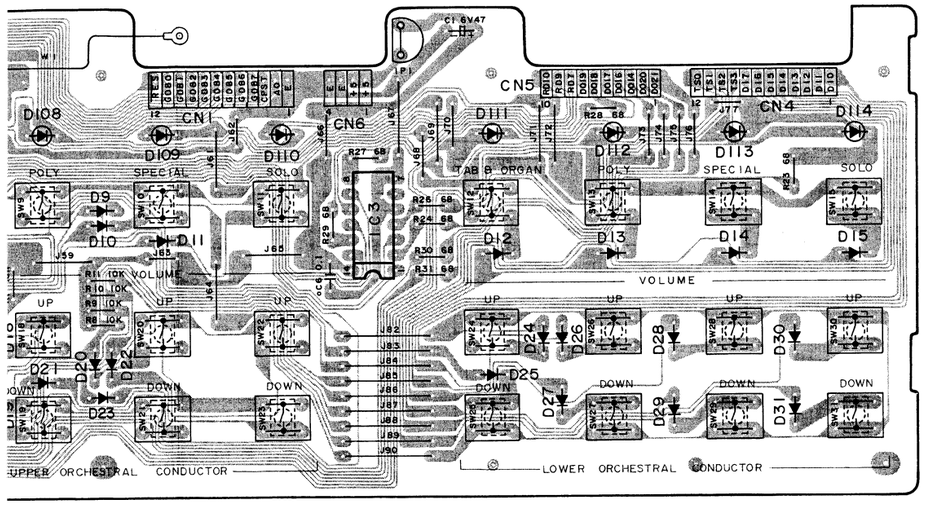
CPL



IEL RIGHT, LEFT & SEQUENCER CONTROL CIRCUIT BOARD

5 6 7 8 9 10 11 12 13 14

SXPG207411B



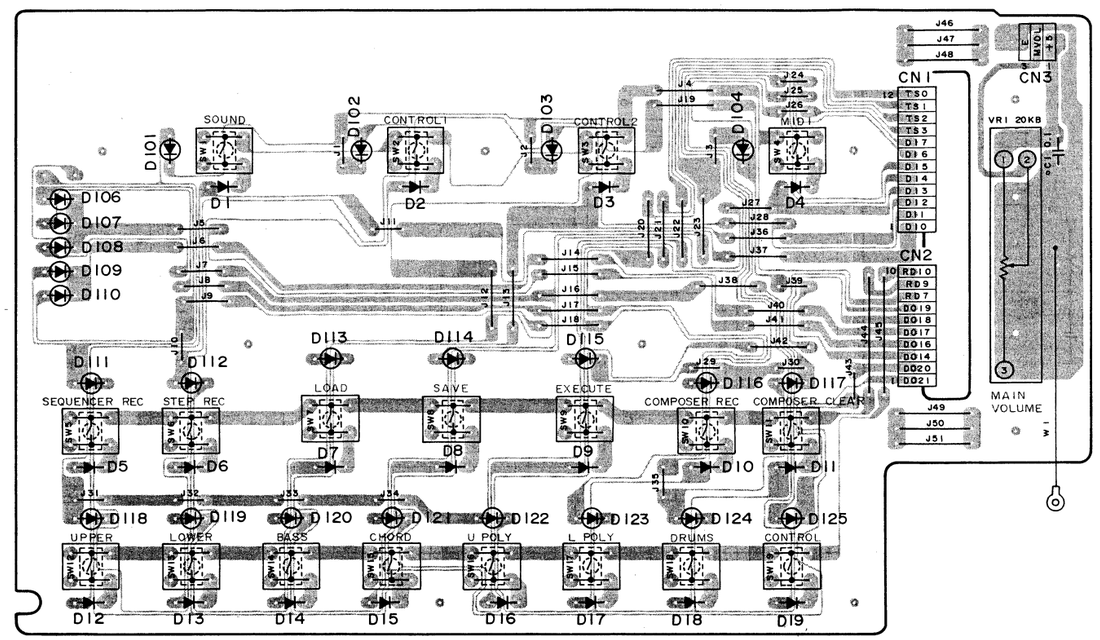
CPR

NOTES:

- IC'S
  - IC1: SVIGM603A121
  - IC2, 3: HD74LS07P
- TRANSISTORS
  - Q1~4: 2SA830SB
- DIODES
  - D1~31: MA165TA5
  - D101~106: LN382G
  - D107~114: LN282R

CPSQ

SXPG207211B

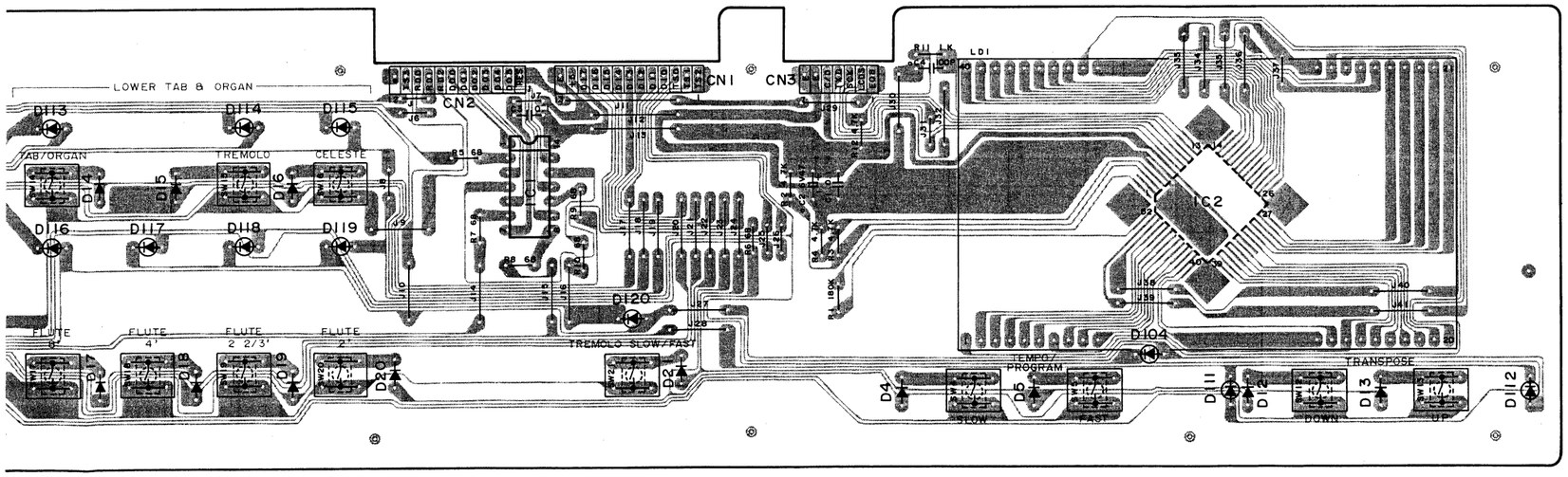


CPSQ

NOTES:

- DIODES
  - D1~19: MA165TA5
  - D101~104, 106~110: LN282R
  - D111~125: LN382G

SXPG207411A



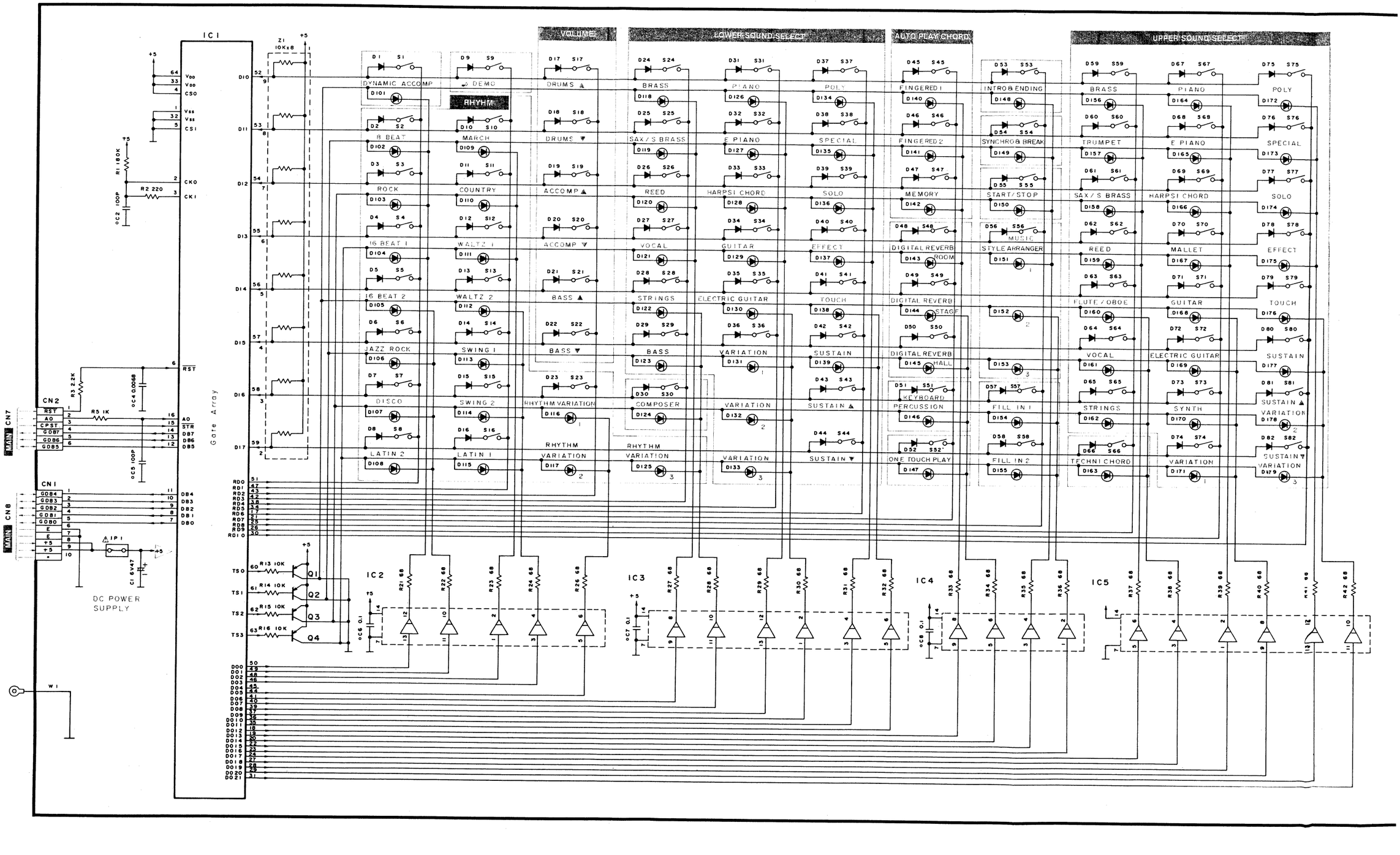
CPL

NOTES:

- IC'S
  - IC1: HD74LS07P
  - IC2: SVIGUPD7225
- DIODES
  - D1~21: MA165TA5
  - D101~103, 105~120: LN282R
  - D104: LN382G

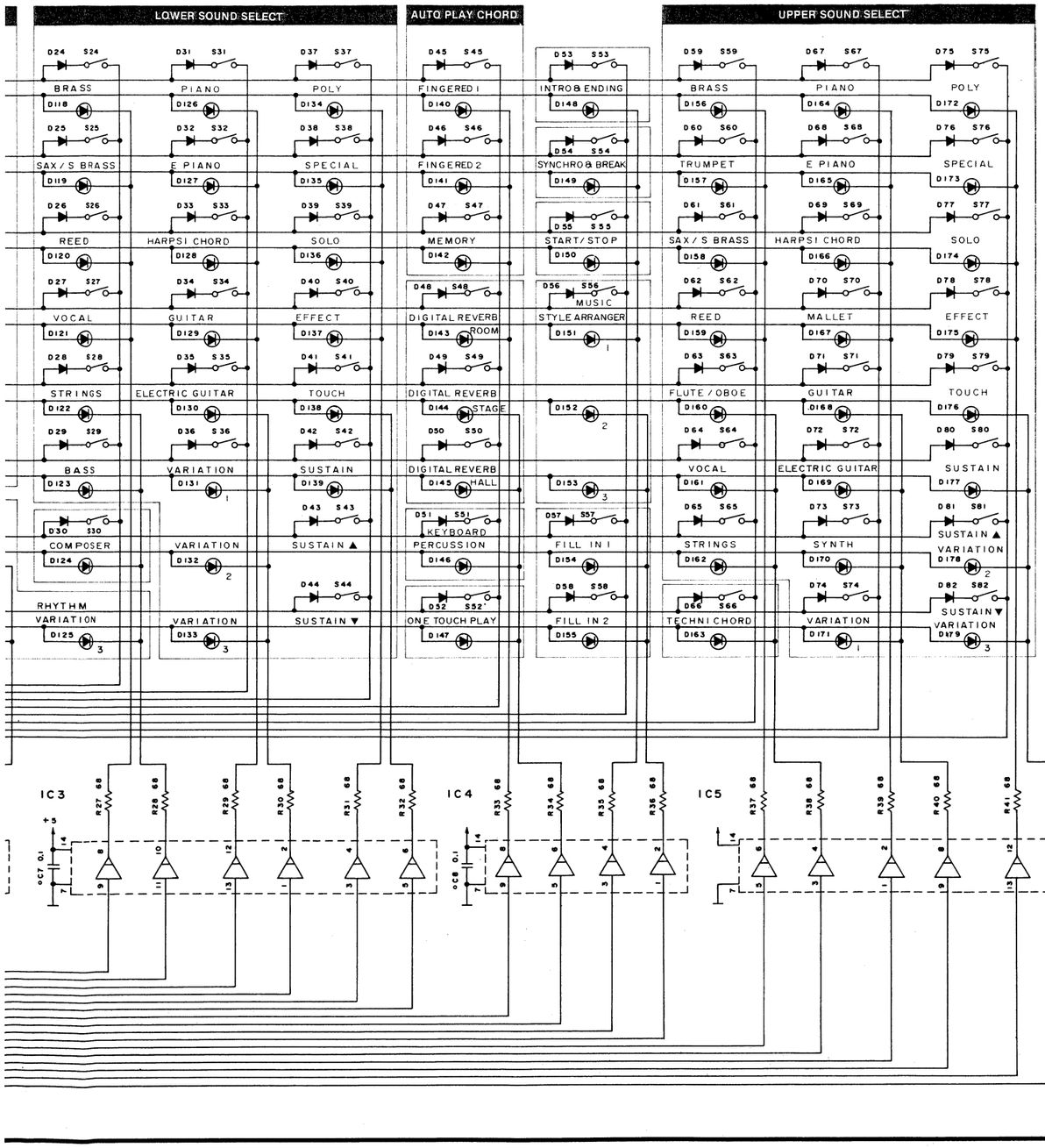
CPSL FDCN LOWER CONTROL PANEL LEFT AND FD CONNECTOR CIRCUIT DIAGRAM

CPSL

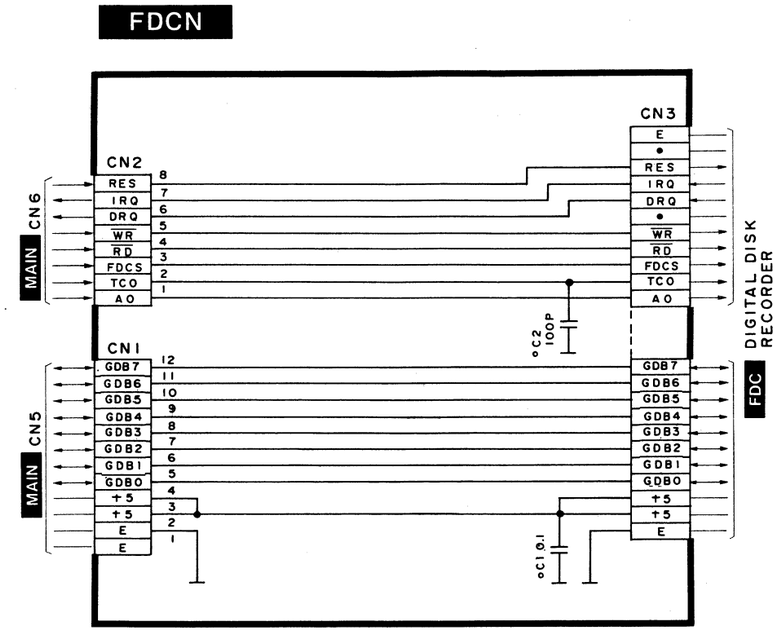


D FD CONNECTOR CIRCUIT DIAGRAM

5 6 7 8 9 10 11 12 13 14



FDCN



CPSL

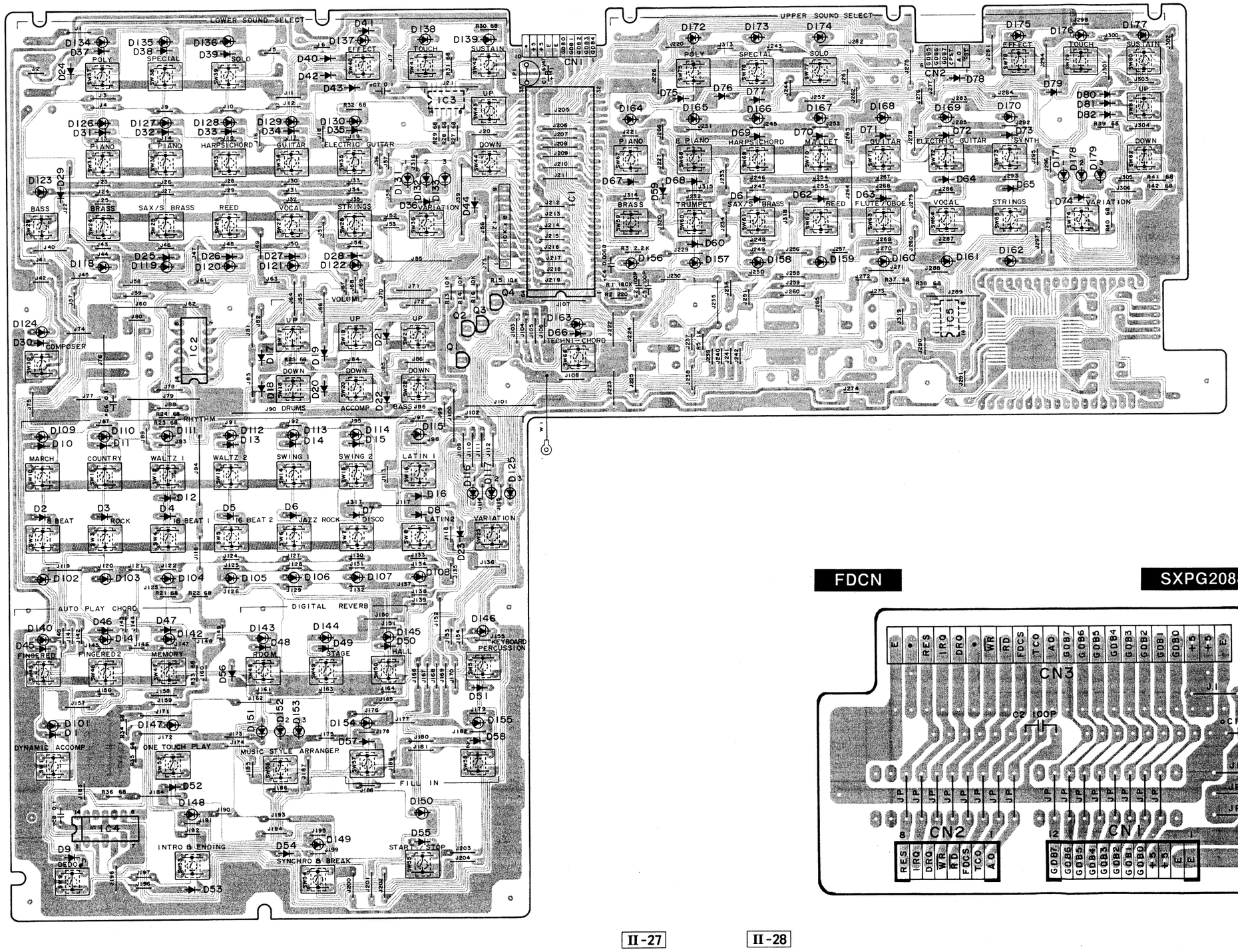
NOTES:

- IC'S
  - IC1: SVIGM603A121
  - IC2, 4: HD74LS07P
  - IC3, 5: M74LS07FP
- TRANSISTORS
  - Q1~4: 2SA830SB
- DIODES
  - D1~82: MA165TA5
  - D101~123, 125~146, 148~179 : LN282R
  - D124, 147: LN382G

CPSL FDCN LOWER CONTROL PANEL LEFT AND FD CONNCTOR CIRCUIT BOARD

CPSL

SXPG207211A



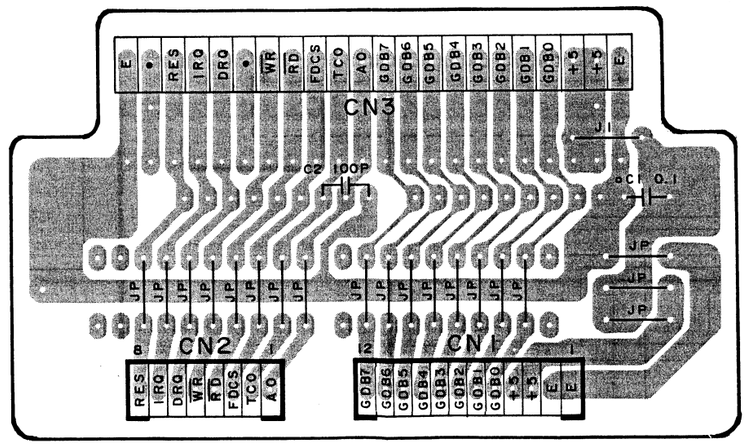
CPSL

NOTES:

- IC'S
  - IC1: SVIGM603A121
  - IC2, 4: HD74LS07P
  - IC3, 5: M74LS07FP
- TRANSISTORS
  - Q1~4: 2SA830SB
- DIODES
  - D1~82: MA165TA5
  - D101~123, 125~146, 148~179 : LN282R
  - D124, 147: LN382G

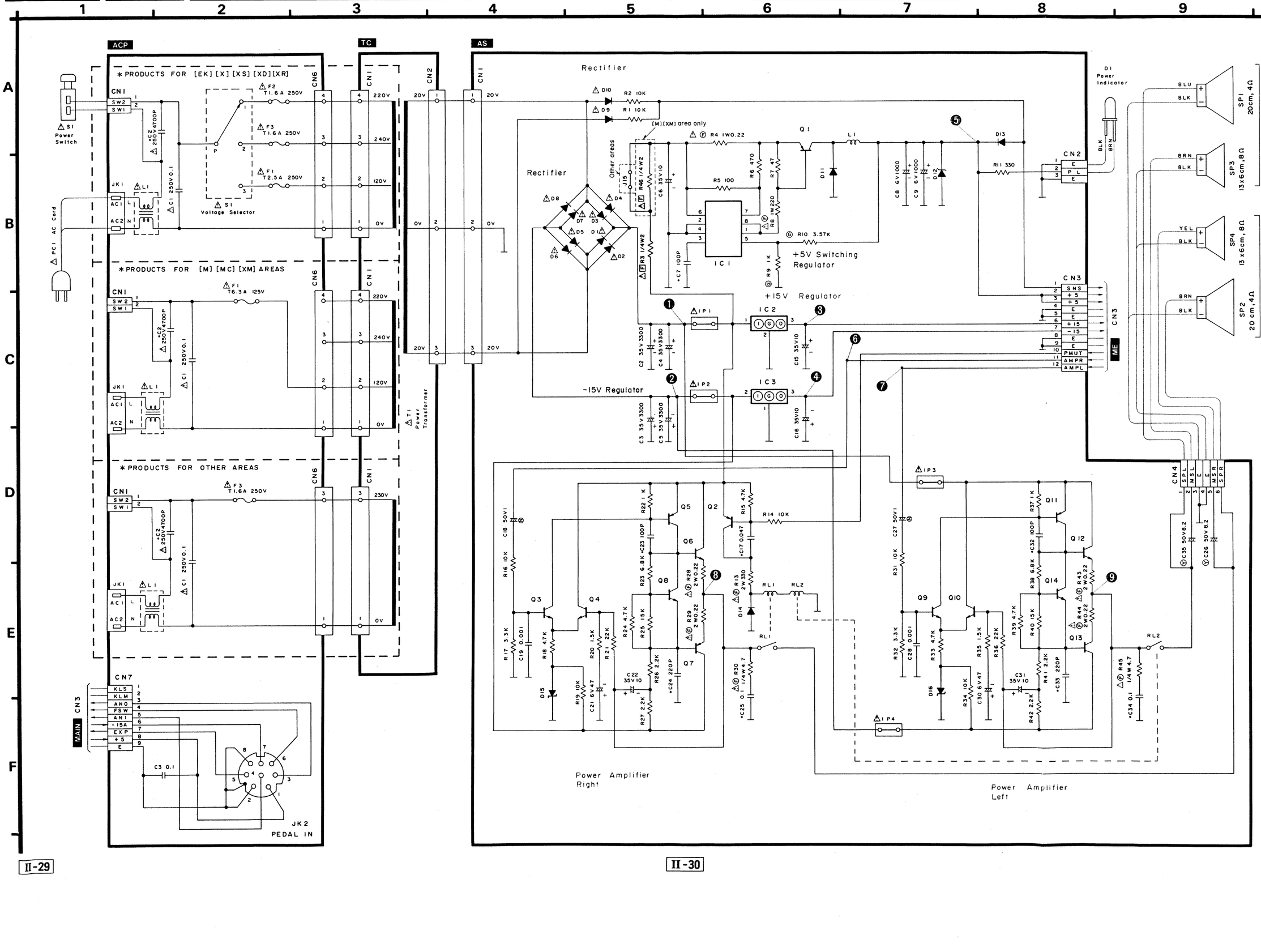
FDCN

SXPG208811B



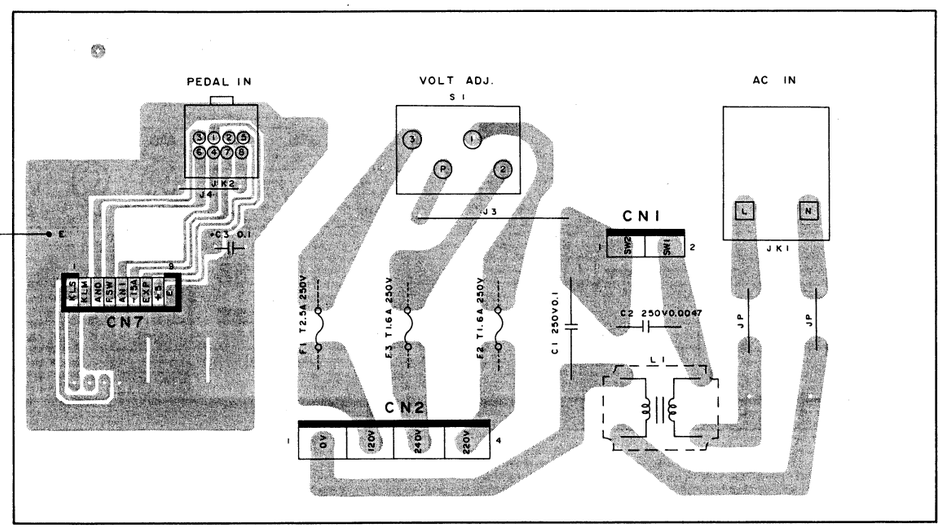
ACP AS

AC POWER SUPPLY AND AMP & POWER SUPPLY CIRCUIT DIAGRAM



ACP AS AC POWER SUPPLY AND AMP & POWER SUPPLY CIRCUIT BOARD

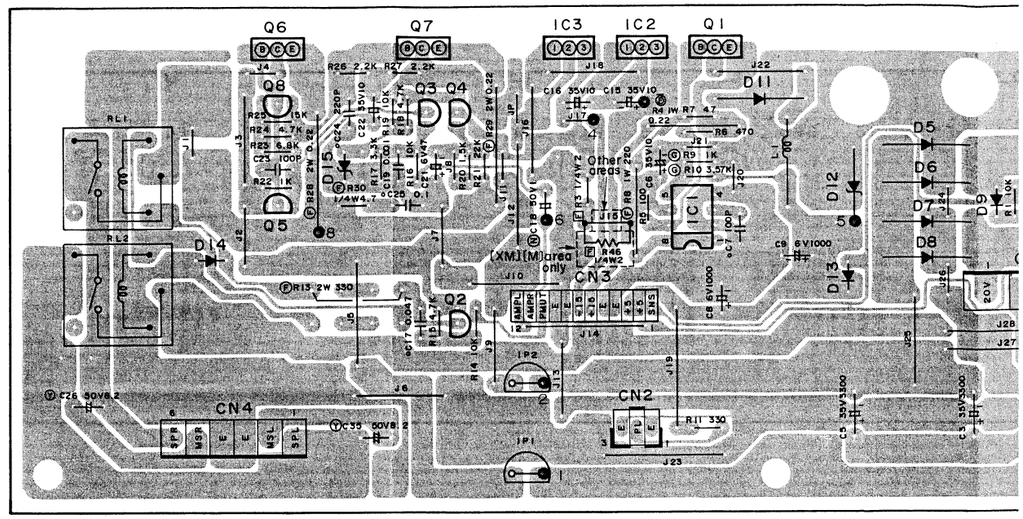
ACP • [EK] [X] [XS] [XD] areas **SXPG208841C** • [XR] area **SXPG208861C**



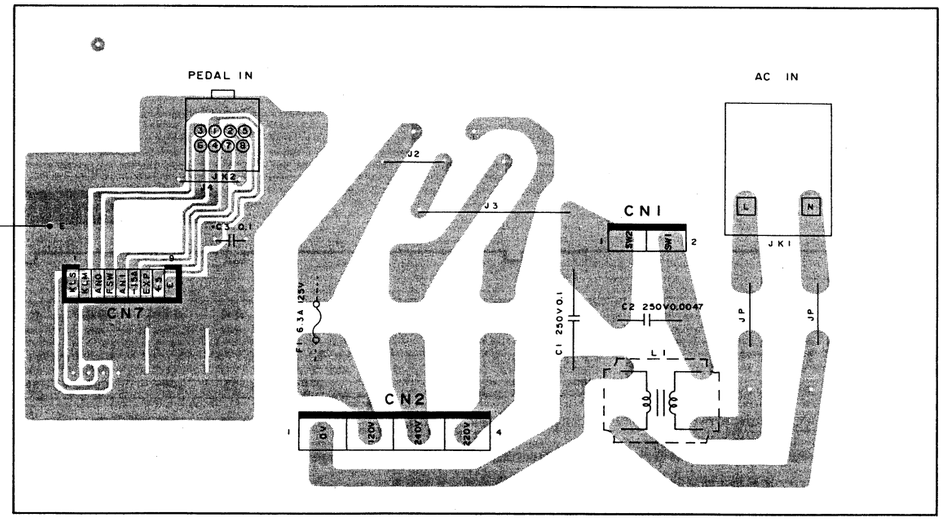
ACP

NOTES:
- FUSES
  - F1: XBA2C25TBO
  - F2, 3: XBA2C16TBO

AS



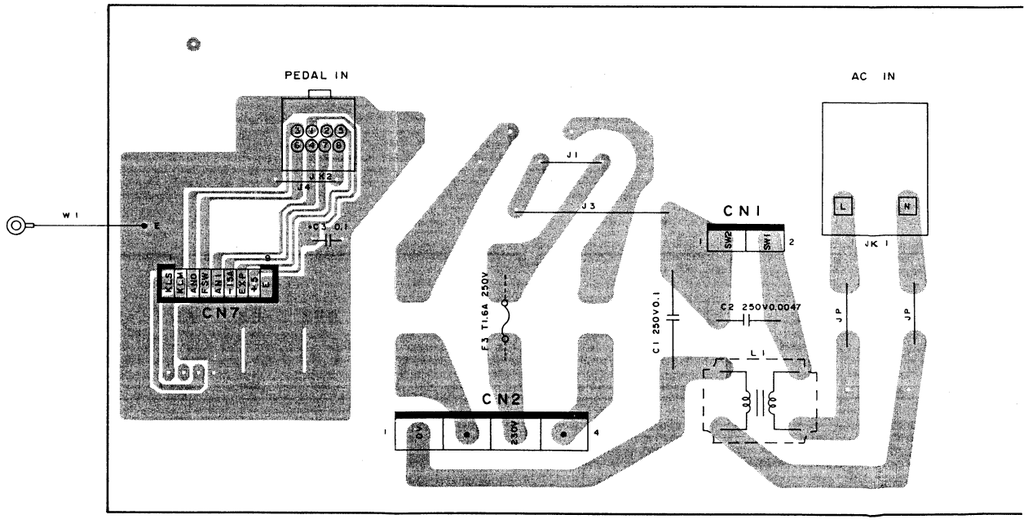
ACP • [M][MC][XM] areas **SXPG208831C**



ACP

NOTES:
- FUSES
  - F1: XBA1C63NU100

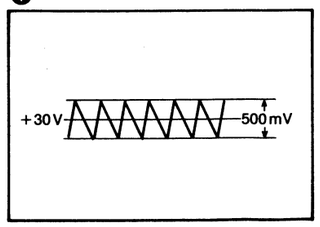
ACP • [XL] area **SXPG208851C** • Other areas **SXPG208811C**



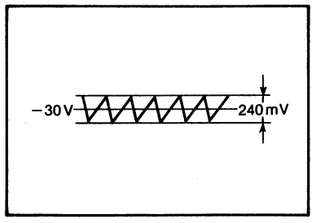
■ Waveform measurement

1. Activate the initial setting method. (Refer to page I-15)
2. Set the touch sensitivity level to the "0". (Refer to page I-15)
3. Set the E. organ to the required mode followings.
   - UPPER ORCHESTRAL CONDUCTOR .....TAB & ORGAN
   - UPPER TAB & ORGAN .....FLUTE 8'——— ON
     FLUTE 16' 4' 2'—— OFF
     TREMOLO——— OFF
   - DIGITAL REVERB.....STAGE

❶



❷



❸ ❹

❸ DC+15V

❹ DC−15V

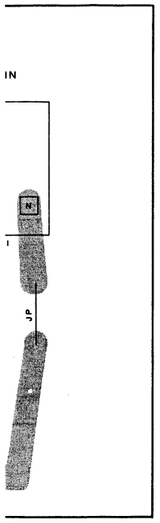
❺

DC+5V

& POWER SUPPLY CIRCUIT BOARD

5 6 7 8 9 10 11 12 13 14

208861C

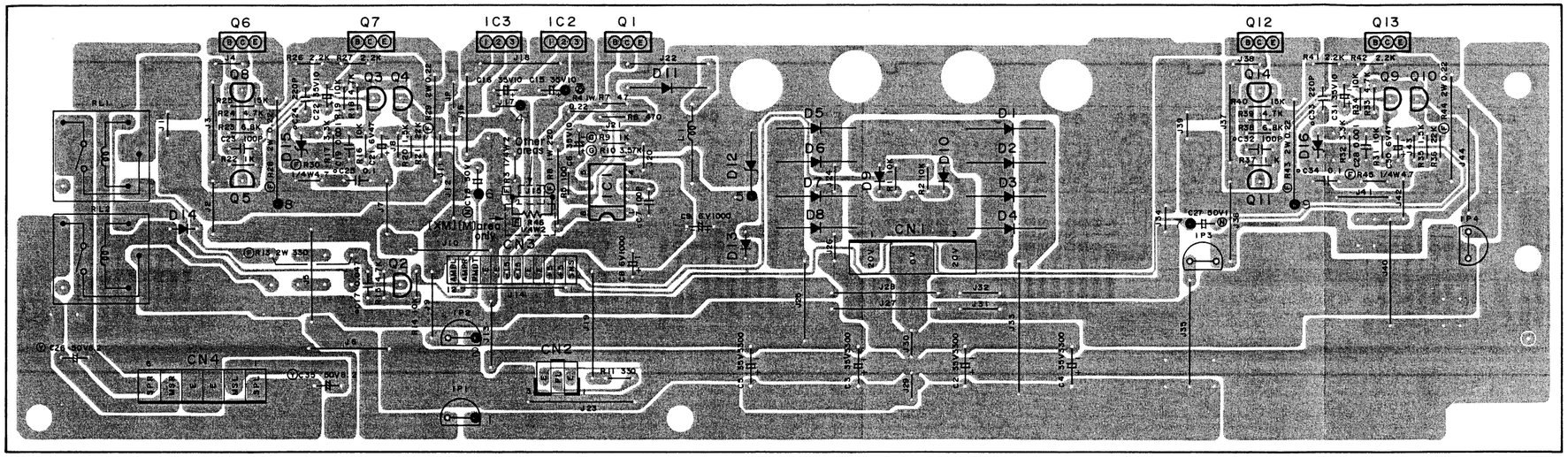


ACP

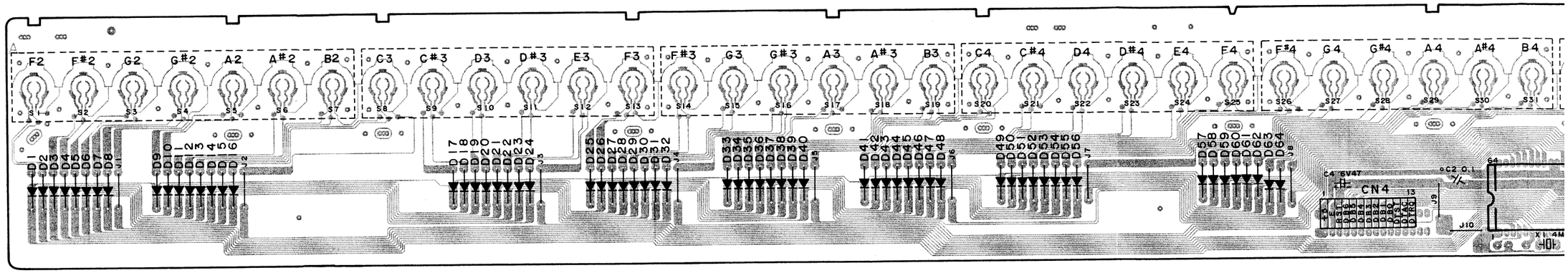
NOTES:
- FUSES
  F1: XBA2C25TBO
  F2, 3: XBA2C16TBO

AS

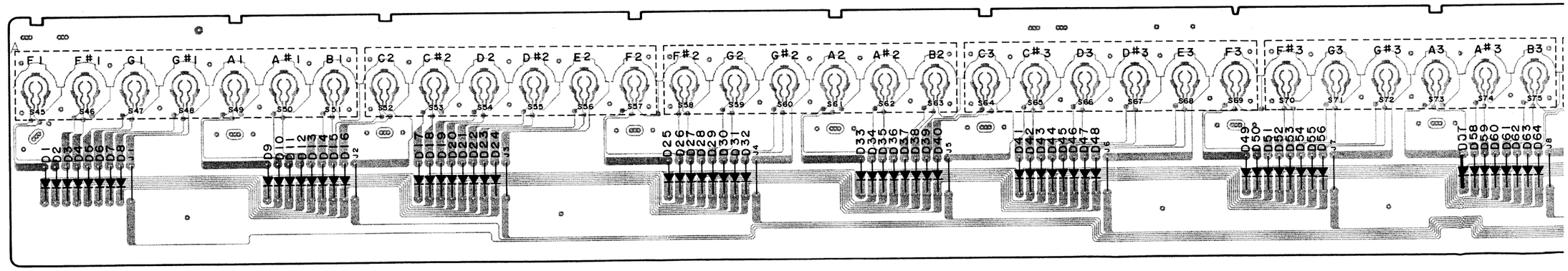
• [M][XM] areas **SXPG208821A** • Other areas **SXPG208811A**



MKBU UPPER MANUAL KEYBOARD CIRCUIT BOARD



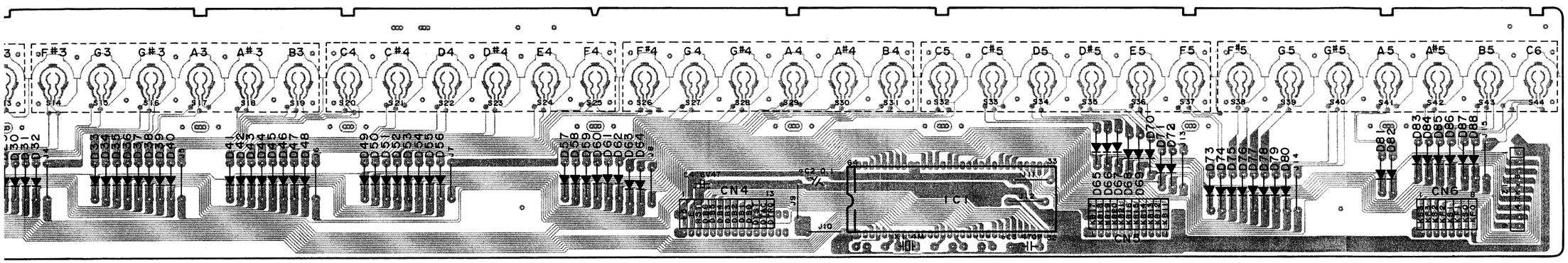
MKBL LOWER MANUAL KEYBOARD CIRCUIT BOARD



D

5 6 7 8 9 10 11 12 13 14

SXPG207611A



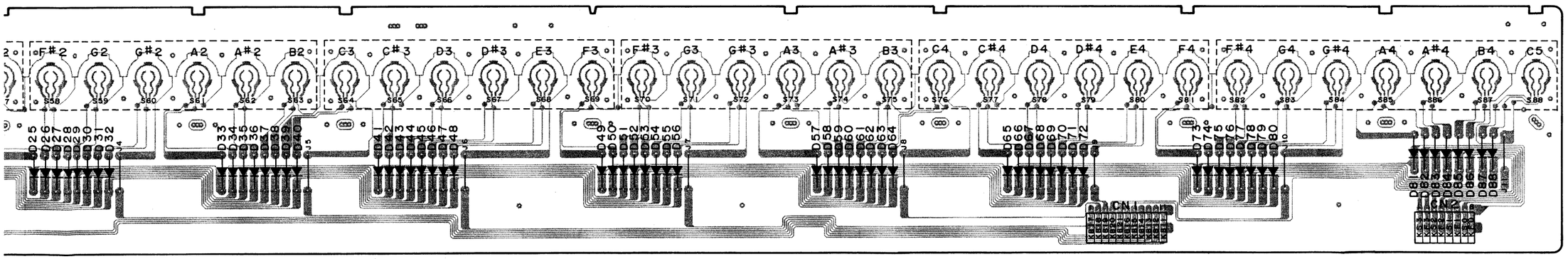
MKBU

NOTES:

- IC'S
  IC1: MN50020PGV
- DIODES
  D1~88: MA162A

OARD

SXPG207611B

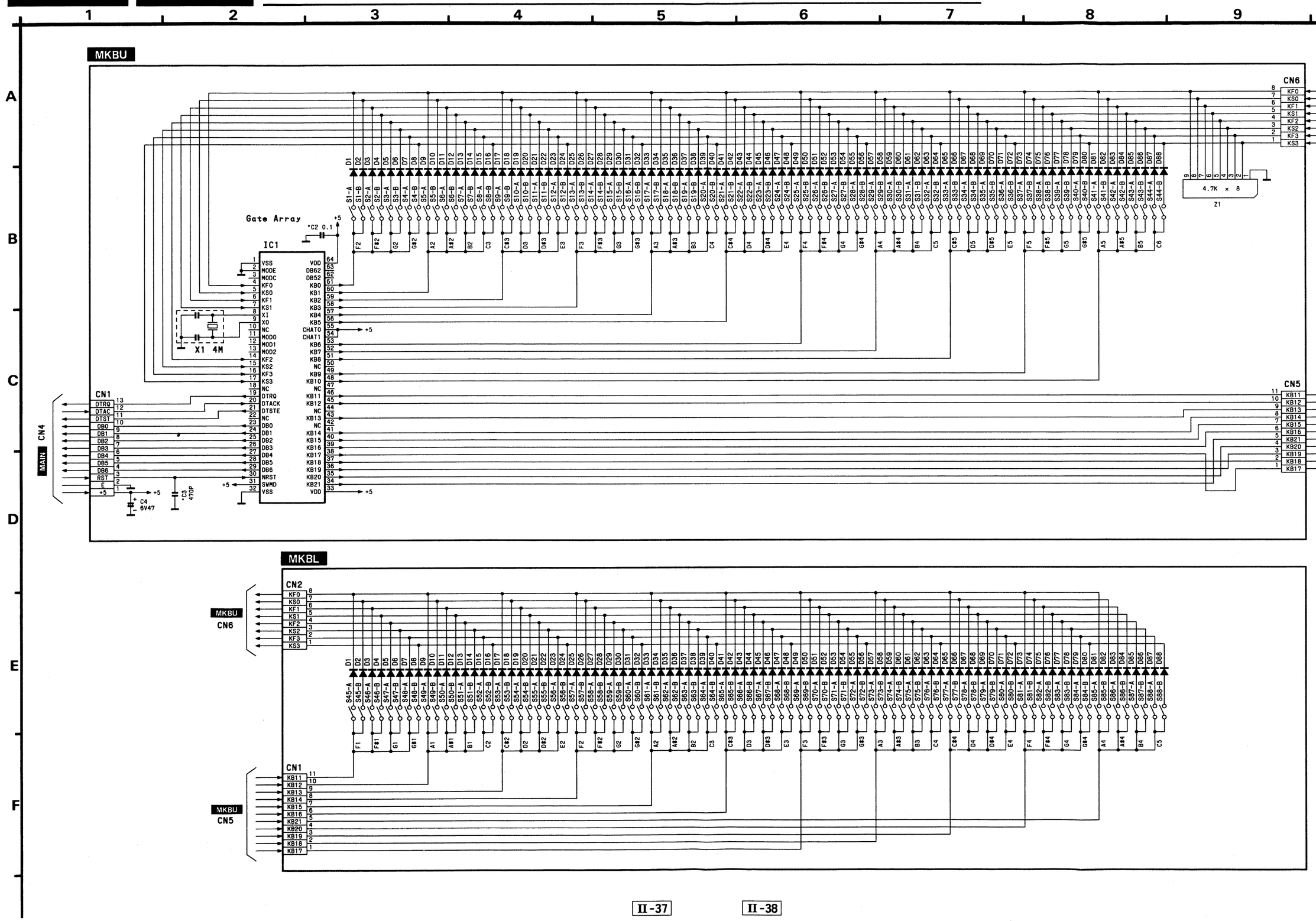


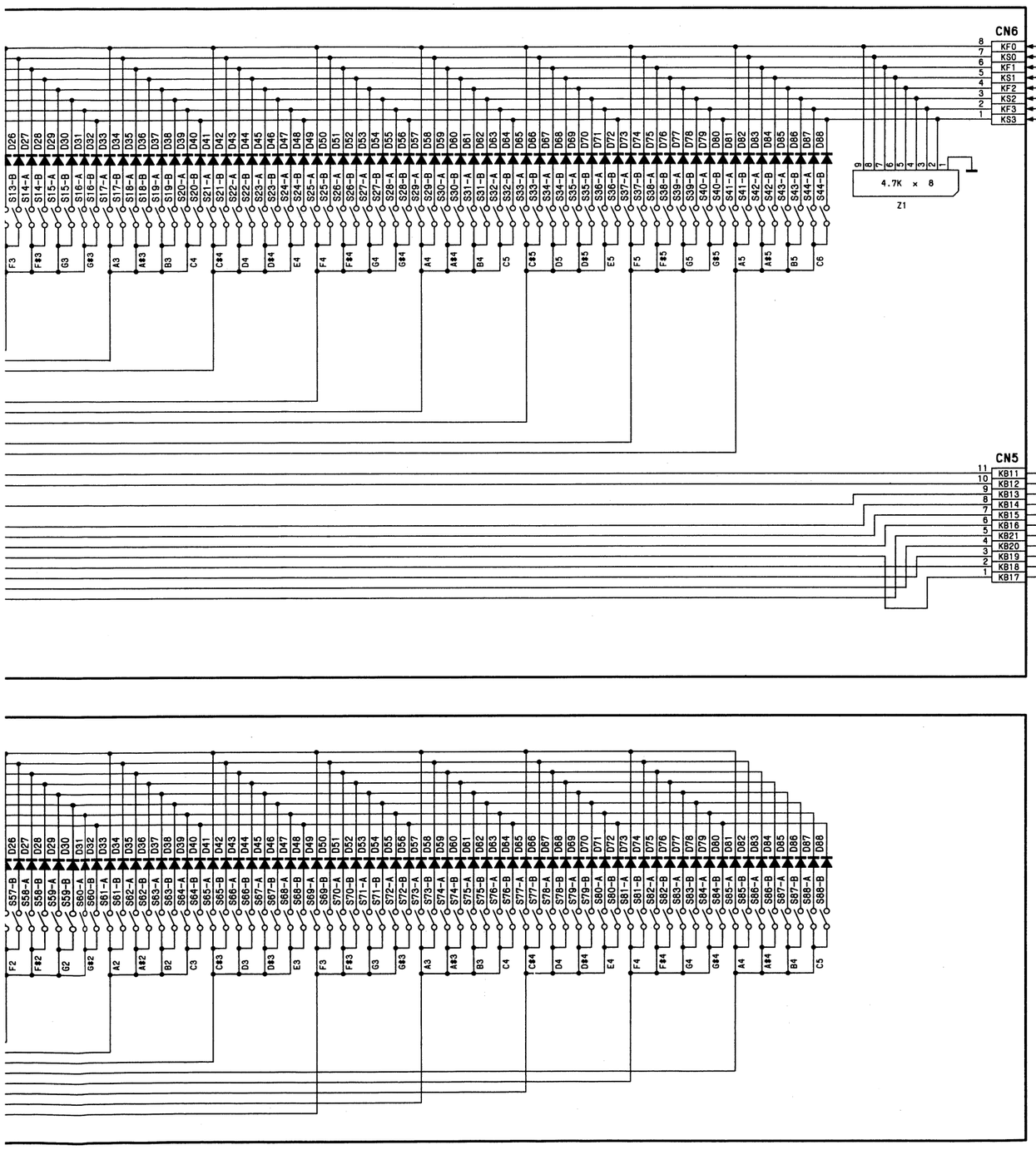
MKBL

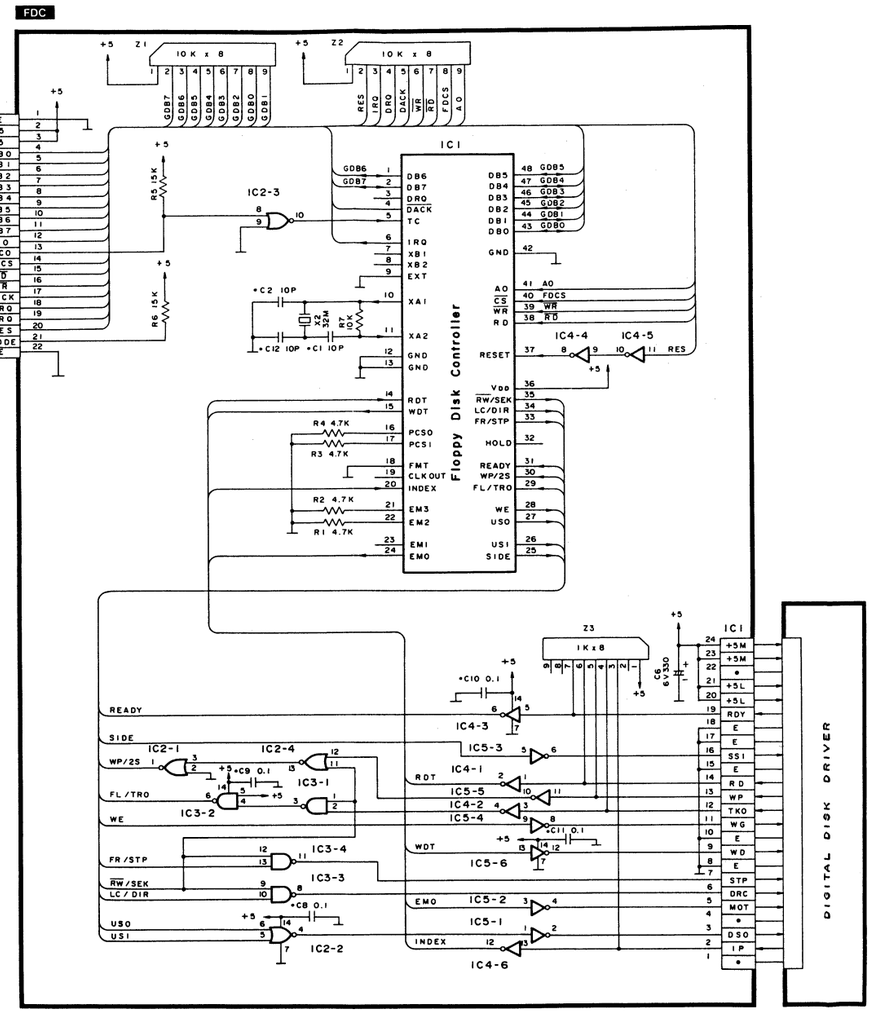
NOTES:

- DIODES
  D89~176: MA162A

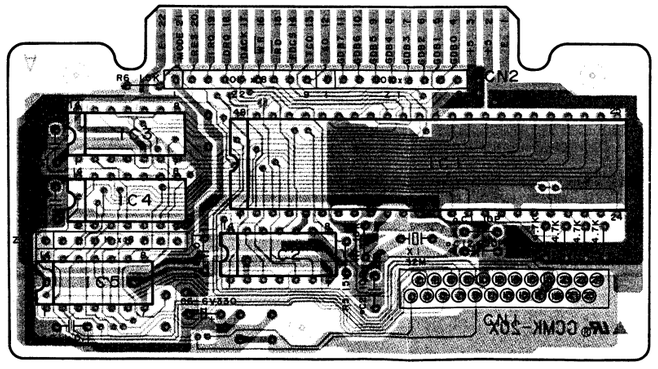
UPPER AND LOWER MANUAL KEYBOARD CIRCUIT DIAGRAM







Circuit view on top of P.C.B.



SXPG208311

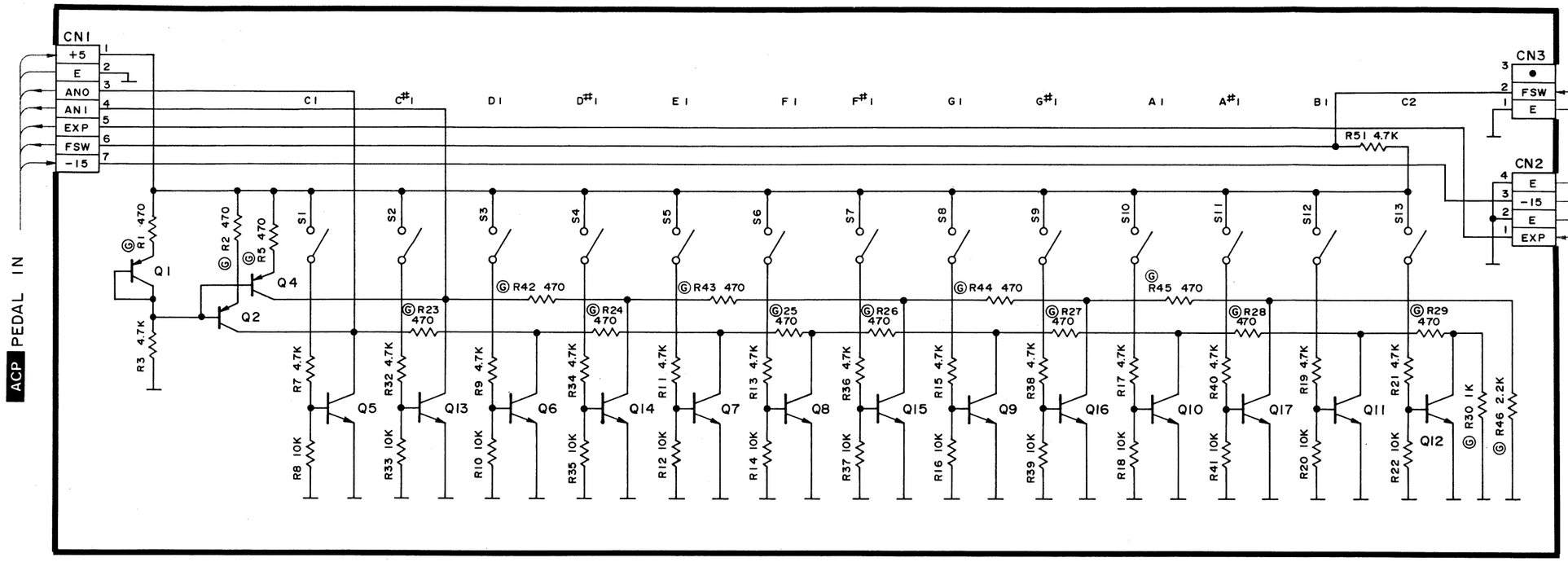
NOTES:

- IC'S

IC1:	SVIGD72067C
IC2:	SVIGN74H02
IC3:	SVIGN74H00
IC4:	SVIGN74H14
IC5:	SVIGN74H04

PKB EXP

PEDAL KEYBOARD AND EXPRESSION CIRCUIT DIAGRAM

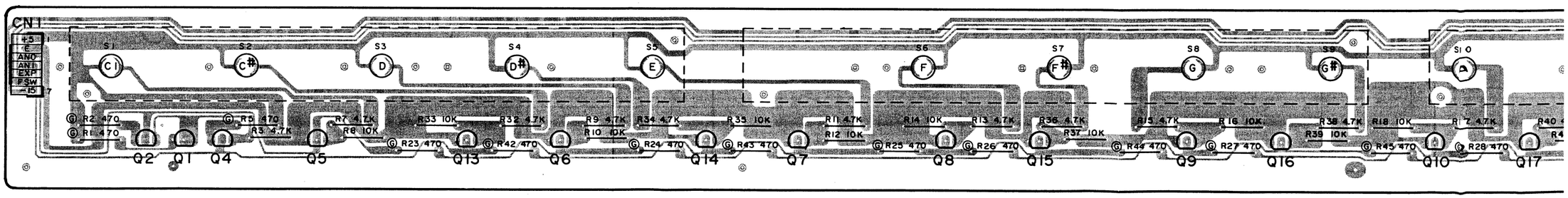


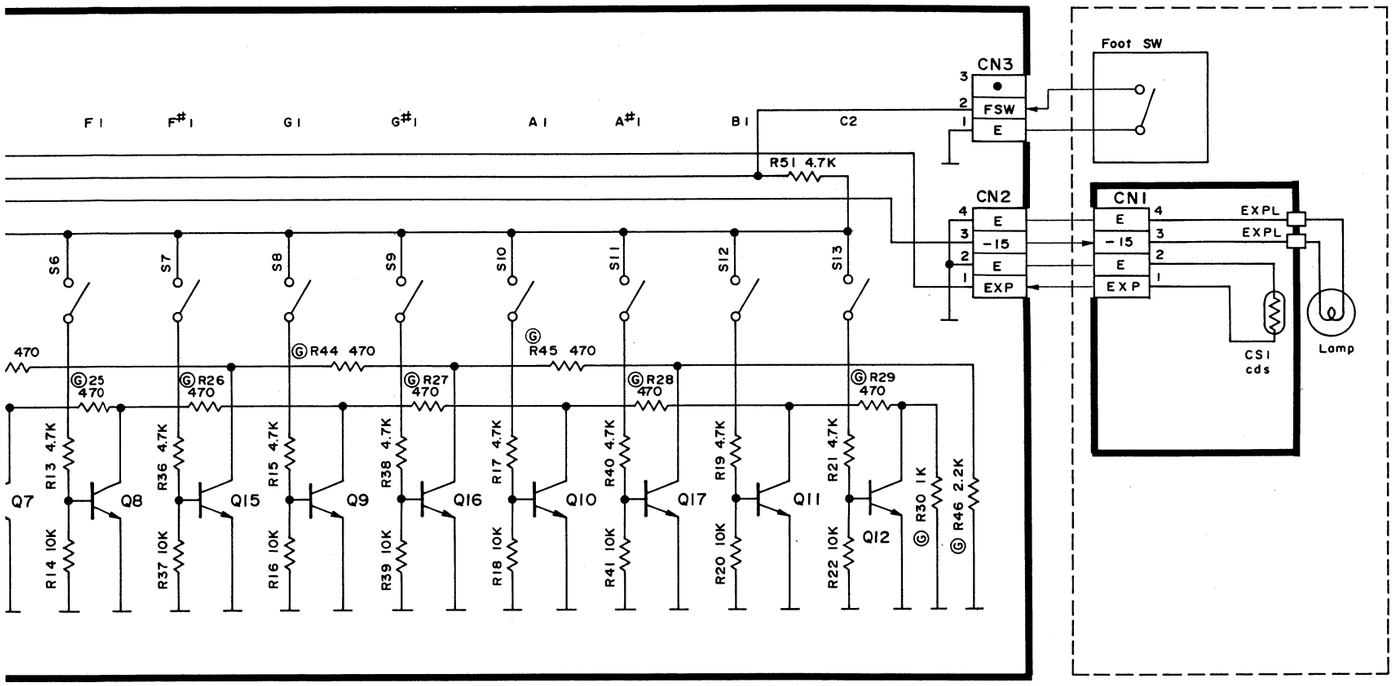
PKB

NOTES:

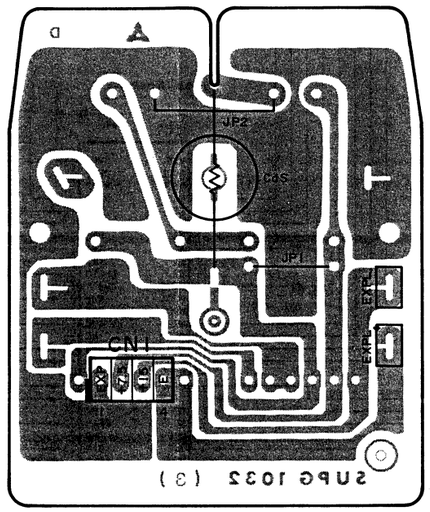
- TRANSISTORS
  - Q1, 2, 4: 2SA1
  - Q5~17: 2SC2

PKB PEDAL KEYBOARD CIRCUIT BOARD





SXPG103211

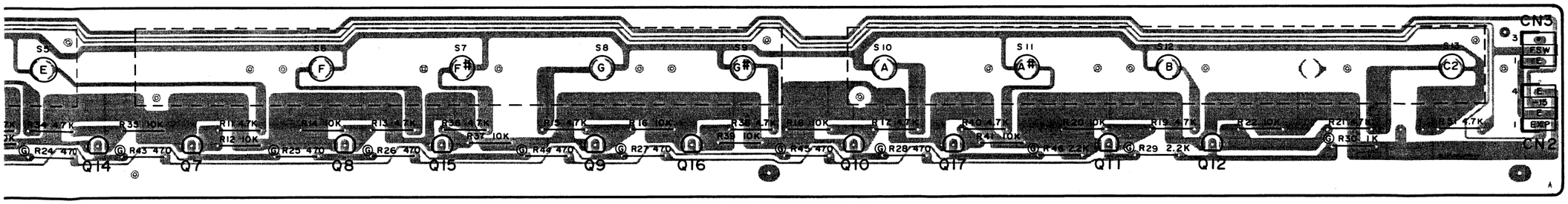


PKB

NOTES:

- TRANSISTORS
  - Q1, 2, 4: 2SA1015-GR
  - Q5～17: 2SC2320LFG

SXPG145111



REPLACEMENT PARTS LIST.....P.C.B. and Wiring Parts

Notes:

1. Printed circuit boards assembly with mark (NLA is no longer available after production discontinuation of the complete set.
2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4. ○ mark are new parts.
5. For part No. with area mark, check the area when placing an order.

■ PRINTED CIRCUIT BOARD

	NLA	Area	Part No.	Description	Per/Set
○	NLA	M XM	SXPG207331	MAIN	1
○	NLA	Others	SXPG207311	MAIN	1
○	NLA		SXPG207511A	ME	1
○	NLA		SXPG207511B	JACK	1
○	NLA		SXPG207411B	CPR	1
○	NLA		SXPG207411A	CPL	1
○	NLA		SXPG207211B	CPSQ	1
○	NLA		SXPG207211A	CPSL	1
○	NLA		SXPG208811B	FDCN	1
○	NLA	M MC XM	SXPG208831C	ACP	1
○	NLA	EK X XS XD	SXPG208841C	ACP	1
○	NLA	XL	SXPG208851C	ACP	1
○	NLA	XR	SXPG208861C	ACP	1
○	NLA	Others	SXPG208811C	ACP	1
○	NLA	M XM	SXPG208821A	AS	1
○	NLA	Others	SXPG208811A	AS	1
○	NLA		SXPG207611A	MKBU	1
○	NLA		SXPG207611B	MKBL	1
	NLA	EK	SXPG208311	FDC	1
	NLA		SXPG145111	PKB	1
	NLA		SXPG103211	EXP	1

MAIN MAIN CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
		INTEGRATED CIRCUITS		
○	IC1	M74HC244FP	3-State Buffers	1
	IC2	T74H4051AF	8-channel Multiplexer	1
	IC3	M5238FP	Operational Amplifier	1
	IC4	SVIGD70320GJ	16 bit Microcomputer	1
	IC5	D65012GF-A79	Gate Array	1
○	IC6	QSIGCEN4AX0	4M bit Programmed EP ROM	1
○	IC7	QSIGH3C02Z10	2M bit Programmed Mask ROM	1
○	IC8	HM65256BLF10	256K bit Pseudo Static RAM	1
○	IC9, 10	M5256BFP12LL	256K bit static RAM	2
	IC11, 12	M74HC00FP	Quad 2-input NAND Gates	2
	IC13	MN73012PGC	Tone Generator LSI 1	1
	IC14	MN73013PGD	Tone Generator LSI 2	1
○	IC15	QSIGU3C08802	8M bit Wave ROM	1
○	IC16	QSIGU3C08801	8M bit Wave ROM	1
○	IC17	PCM55HP	D-A Converter	1
	IC18	M5238FP	Operational Amplifier	1
	IC19	T74H4051AF	8-channel Multiplexer	1
○	IC20	M5220FP	Operational Amplifier	1
○	IC21	M5218AFP	Operational Amplifier	1
	IC22	MN8305S	A-D/D-A Converter	1
	IC23	SVIG87064073	Digital Signal Processor	1
○	IC24	HM65256BLF10	256K bit Pseudo Static RAM	1
	IC25	SVIGMB622416	Gate Array	1
	IC26	MN1280R	Reset IC	1
	IC27	SVIGM5278L05	+5V Voltage Regulator	1
○	IC28	M74HC02FP	Quad 2-Input NOR Gates	1
		TRANSISTORS		
	Q1	2SJ105GR	FET	1
S	Q2	2SC1815GR	Transistor	1
S	Q3	2SA1015-GR	2SA933STRS (SUB. Part)	1
		DIODES		
	D1~4, 7, 8	MA165TA5	Diode	7
	D6	MA4051MTA	Zener, 5.1V	1
	D9, 10	MA4056H	Zener, 5.8V	2
	D11	EK04	Diode	1
	D12, 13, 101	MA165TA5	Diode	3
		OSCILLATORS		
	X1	QSXG1A1400A	14MHz, Quartz Oscillator	1
	X2	QSXG1B4000B	40MHz, Quartz Oscillator	1
	X3	SVQGA20MX040	20MHz, Ceramic Oscillator	1
		COMPONENT COMBINATIONS		
	Z1, 2, 4	EXBPI8472JM	4.7kΩ×8	3
	Z3	EXAMR14A1002	1kΩ/2kΩ, Ladder Network	1
		COILS		
	L1, 101~105	QLQGT1B600MA	Coil	6
	L15, 22	QLQGT3T150SA	Coil	2
		SEMI-FIXED RESISTORS		
	VR1, 2	EVND4AA00B14	10kΩ B, Offset Adj, DRV Bias Adj.	2
		RESISTORS		
	R1	ERDS2TJ184	180kΩ	1
	R2	ERDS2TJ472	4.7kΩ	1
	R3~6	ERDS2TJ102	1kΩ	4
	R7, 8	ERDS2TJ472	4.7kΩ	2
	R9, 10	ERDS2TJ473	47kΩ	2
	R11	ERDS2TJ103	10kΩ	1
	R12	ERDS2TJ102	1kΩ	1
	R13	ERDS2TJ103	10kΩ	1
	R16	ERDS2TJ472	4.7kΩ	1
	R17	ERDS2TJ154	150kΩ	1
	R19, 20	ERDS2TJ102	1kΩ	2
	R21	ERDS2TJ104	100kΩ	1
	R22	ERDS2TJ103	10kΩ	1
	R23	ERDS2TJ473	47kΩ	1
	R24	ERDS2TJ472	4.7kΩ	1
	R25~30	ERDS2TJ103	10kΩ	6
	R31	ERDS2TJ472	4.7kΩ	1

Ref. No.	Part No.	Description	Per/Set
R32	ERDS2TJ473	47kΩ	1
R33	ERDS2TJ332	3.3kΩ	1
R34	ERDS2TJ183	18kΩ	1
R39	ERDS2TJ102	1kΩ	1
R40	ERDS2TJ154	150kΩ	1
R41	ERDS2TJ682	6.8kΩ	1
R42	ERDS2TJ123	12kΩ	1
R43	ERDS2TJ473	47kΩ	1
R44	ERDS2TJ223	22kΩ	1
R45	ERDS2TJ103	10kΩ	1
R46	ERDS2TJ473	47kΩ	1
R47	ERDS2TJ223	22kΩ	1
R48	ERDS2TJ103	10kΩ	1
R55	ERDS2TJ681	680Ω	1
R56, 57	ERDS2TJ472	4.7kΩ	2
R58	ERDS2TJ155	1.5MΩ	1
R59	ERDS2TJ334	330kΩ	1
R60	ERDS2TJ225	2.2MΩ	1
R61	ERDS2TJ101	100Ω	1
R62	ERDS2TJ332	3.3kΩ	1
R63	ERDS2TJ562	5.6kΩ	1
R64	ERDS2TJ105	1MΩ	1
R65	ERDS2TJ472	4.7kΩ	1
R66~69	ERDS2TJ681	680Ω	4
R71 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	1
R72	ERDS2TJ152	1.5kΩ	1
R73	ERDS2TJ563	56kΩ	1
R74	ERDS2TJ823	82kΩ	1
R75, 76	ERDS2TJ103	10kΩ	2
R77	ERDS2TJ473	47kΩ	1
R78	ERDS2TJ682	6.8kΩ	1
R79	ERDS2TJ332	3.3kΩ	1
R80	ERDS2TJ183	18kΩ	1
R81	ERDS2TJ103	10kΩ	1
R82	ERDS2TJ472	4.7kΩ	1
R83	ERDS2TJ153	15kΩ	1
R84	ERDS2TJ103	10kΩ	1
R85	ERDS2TJ472	4.7kΩ	1
R86	ERDS2TJ153	15kΩ	1
R89	ERDS2TJ105	1MΩ	1
R90~94	ERDS2TJ152	1.5kΩ	5
R95, 96	ERDS2TJ471	470Ω	2
R97, 98 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	2
R99~101 ⚠	ERQ14AJ2R0	2Ω, 1/4W, Fuse Type	3
R106	ERDS2TJ103	10kΩ	1
R107~110	ERDS2TJ472	4.7kΩ	4
R111, 112	ERDS2TJ103	10kΩ	2
R113	ERDS2TJ823	82kΩ	1
R114	ERDS2TJ101	100Ω	1
R201~203	ERDS2TJ103	10kΩ	3
R210	ERDS2TJ154	150kΩ	1
R211~253	ERDS2TJ221	220Ω	43
R254	ERDS2TJ102	1kΩ	1
CAPACITORS			
C1	ECRR1H104ZF	0.1μF	1
C2	ECKR1E473ZV	0.047μF	1
C3~5	ECRR1H104ZF	0.1μF	3
C7, 8	ECRR1H104ZF	0.1μF	2
C12	ECCR1H221J	220pF	1
C13	ECCR1H101J	100pF	1
C14, 15	ECCR1H030C	3pF	2
C16	ECEA0JKA331	330μF, 6.3V	1
C17	ECRR1H104ZF	0.1μF	1
C19	ECEA1HKA010	1μF, 50V	1
C20	ECKR1E473ZV	0.047μF	1
C22	ECEA0JKA331	330μF, 6.3V	1

Ref. No.	Part No.	Description	Per/Set
C23	ECEA0JKA470	47μF, 6.3V	1
C24	ECQV1H474JZ	0.47μF	1
C25~27	ECRR1H104ZF	0.1μF	3
C28, 29	ECKR1E473ZV	0.047μF	2
C31	ECRR1H104ZF	0.1μF	1
C32, 33	ECEA0JKA470	47μF, 6.3V	2
C34	ECCR1H471J	470pF	1
C36	ECCR1H220J	22pF	1
C37, 38	ECKR1E473ZV	0.047μF	2
C39, 40	ECRR1H104ZF	0.1μF	2
C41	ECEA1CKN100	10μF, 16V	1
C42	ECEA1CKA470	47μF, 16V	1
C44, 45	ECEA0JKA331	330μF, 6.3V	2
C46, 47	ECEA1HKA010	1μF, 50V	2
C48	ECQG1H152KZ	0.0015μF	1
C49	ECCR1H151J	150pF	1
C50	ECEA1HKA010	1μF, 50V	1
C51	ECQG1H152KZ	0.0015μF	1
C52	ECEA1HKA010	1μF, 50V	1
C53	ECQG1H152KZ	0.0015μF	1
C54~56	ECEA0JKA101	100μF, 6.3V	3
C57	ECKR1E473ZV	0.047μF	1
C60	ECCR1H101J	100pF	1
C61, 62	ECCR1H030C	3pF	2
C64, 65	ECCR1H470J	47pF	2
C67, 68	ECEA1CKA101	100μF, 16V	2
C69	ECRR1H104ZF	0.1μF	1
C70	ECEA0JKA221	220μF, 6.3V	1
C71	EECF5R5U105	1F, 5.5V, Memory Back-up	1
C72	ECRR1H104ZF	0.1μF	1
C73	ECQG1H102KZ	0.001μF	1
C100~102	ECRR1H104ZF	0.1μF	3
C103	ECEA0JKA331	330μF, 6.3V	1
C110~112	ECRR1H104ZF	0.1μF	3

ME MIXING & EFFET CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	INTEGRATED CIRCUITS			
	IC1	SVIGT74H4051	8-channel Multiplexer	1
S	IC2, 3, 5~8, 10~15, 22~24, 26, 27, 29	SVIGM5218L	Operational Amplifier	17
	IC4, 8	SVIGLM1894N	Dynamic Noise Reduction	2
	IC9	SVIGM5241L	Dual VCA	1
	IC16~18	MN3009	BBD (256 stages)	3
	IC19~21	SVIGMSM4011	Quad 2-input NAND Gates	3
	IC25	SVIGM5238L	Operational Amplifier	1
	IC28	SVIGM74H4066	Quad Bilateral Switches	1
	TRANSISTORS			
	Q1, 2	2SJ105GR	FET	2
	Q3, 5	2SC3940ARS	Transistor	2
	Q4, 6	2SA1534ARS	Transistor	2
S	Q7	2SA1015-GR	2SA933STRS (SUB. Part)	1
S	Q8~10	2SC1815GR	Transistor	3
	DIODES			
	D1	EK04	Diode	1
	D2	MA4051MTA	Zener, 5.1V	1
	D3~12, 302, 303	MA165TA5	Diode	12

Ref. No.	Part No.	Description	Per/Set
SEMI-FIXED RESISTOR			
VR1	EVND4AA00B24	20kΩ B, BBD Bias Adj.	1
RESISTORS			
R1~9	ERDS2TJ101	100Ω	9
R10	ERDS2TJ682	6.8kΩ	1
R11~13	ERDS2TJ473	47kΩ	3
R14	ERDS2TJ225	2.2MΩ	1
R16	ERDS2TJ682	6.8kΩ	1
R17~19	ERDS2TJ473	47kΩ	3
R20	ERDS2TJ225	2.2MΩ	1
R21, 22	ERDS2TJ472	4.7kΩ	2
R23	ERDS2TJ331	330Ω	1
R24	ERDS2TJ102	1kΩ	1
R25	ERDS2TJ221	220Ω	1
R26	ERDS2TJ331	330Ω	1
R27	ERDS2TJ474	470kΩ	1
R28	ERDS2TJ124	120kΩ	1
R29	ERDS2TJ154	150kΩ	1
R30	ERDS2TJ332	3.3kΩ	1
R38	ERDS2TJ474	470kΩ	1
R41, 42	ERDS2TJ154	150kΩ	2
R47	ERDS2TJ104	100kΩ	1
R48	ERDS2TJ474	470kΩ	1
R49	ERDS2TJ104	100kΩ	1
R50	ERDS2TJ124	120kΩ	1
R51	ERDS2TJ683	68kΩ	1
R52	ERDS2TJ823	82kΩ	1
R53	ERDS2TJ154	150kΩ	1
R54	ERDS2TJ274	270kΩ	1
R55	ERDS2TJ823	82kΩ	1
R56, 57	ERDS2TJ104	100kΩ	2
R58	ERDS2TJ124	120kΩ	1
R59	ERDS2TJ104	100kΩ	1
R60	ERDS2TJ274	270kΩ	1
R61	ERDS2TJ154	150kΩ	1
R62	ERDS2TJ823	82kΩ	1
R63	ERDS2TJ683	68kΩ	1
R64	ERDS2TJ823	82kΩ	1
R65, 66	ERDS2TJ104	100kΩ	2
R67	ERDS2TJ472	4.7kΩ	1
R68	ERDS2TJ222	2.2kΩ	1
R69	ERDS2TJ472	4.7kΩ	1
R70~72	ERDS2TJ333	33kΩ	3
R73	ERDS2TJ472	4.7kΩ	1
R74	ERDS2TJ222	2.2kΩ	1
R75	ERDS2TJ472	4.7kΩ	1
R76~78	ERDS2TJ333	33kΩ	3
R80, 81	ERDS2TJ331	330Ω	2
R83, 84	ERDS2TJ472	4.7kΩ	2
R85	ERDS2TJ331	330Ω	1
R86	ERDS2TJ681	680Ω	1
R87	ERDS2TJ682	6.8kΩ	1
R88	ERDS2TJ224	220kΩ	1
R89	ERDS2TJ682	6.8kΩ	1
R90	ERDS2TJ152	1.5kΩ	1
R91	ERDS2TJ103	10kΩ	1
R93	ERDS2TJ103	10kΩ	1
R95	ERDS2TJ333	33kΩ	1
R96	ERDS2TJ224	220kΩ	1
R97	ERDS2TJ333	33kΩ	1
R98	ERDS2TJ224	220kΩ	1
R100, 101	ERDS2TJ222	2.2kΩ	2
R103	ERDS2TJ220	22Ω	1
R104	ERDS2TJ224	220kΩ	1
R105	ERDS2TJ684	680kΩ	1
R106	ERDS2TJ334	330kΩ	1

Ref. No.	Part No.	Description	Per/Set
R107	ERDS2TJ224	220kΩ	1
R108	ERDS2TJ220	22Ω	1
R109	ERDS2TJ224	220kΩ	1
R110	ERDS2TJ334	330kΩ	1
R111	ERDS2TJ684	680kΩ	1
R112	ERDS2TJ683	68kΩ	1
R113	ERDS2TJ154	150kΩ	1
R115	ERDS2TJ103	10kΩ	1
R116	ERDS2TJ683	68kΩ	1
R117	ERDS2TJ154	150kΩ	1
R119	ERDS2TJ103	10kΩ	1
R120	ERDS2TJ333	33kΩ	1
R121	ERDS2TJ104	100kΩ	1
R122	ERDS2TJ333	33kΩ	1
R123	ERDS2TJ104	100kΩ	1
R124~131	ERDS2TJ334	330kΩ	8
R132	ERDS2TJ474	470kΩ	1
R133	ERDS2TJ103	10kΩ	1
R143~145	ERDS2TJ473	47kΩ	3
R146	ERDS2TJ104	100kΩ	1
R147	ERDS2TJ103	10kΩ	1
R148	ERDS2TJ333	33kΩ	1
R149	ERDS2TJ103	10kΩ	1
R150	ERDS2TJ333	33kΩ	1
R151	ERDS2TJ103	10kΩ	1
R154, 155	ERDS2TJ683	68kΩ	2
R156, 157	ERDS2TJ154	150kΩ	2
R158	ERDS2TJ104	100kΩ	1
R159	ERDS2TJ224	220kΩ	1
R160, 161	ERDS2TJ154	150kΩ	2
R162	ERDS2TJ104	100kΩ	1
R163	ERDS2TJ224	220kΩ	1
R164~166	ERDS2TJ473	47kΩ	3
R167, 168	ERDS2TJ104	100kΩ	2
R169	ERDS2TJ102	1kΩ	1
R170	ERDS2TJ473	47kΩ	1
R171 ⚠	ERD2FCVG100	10Ω, 1/4W, Fuse Type	1
R172	ERDS2TJ473	47kΩ	1
R173 ⚠	ERD2FCVG100	10Ω, 1/4W, Fuse Type	1
R174	ERDS2TJ473	47kΩ	1
R175 ⚠	ERD2FCVG100	10Ω, 1/4W, Fuse Type	1
R176	ERDS2TJ473	47kΩ	1
R177~179	ERDS2TJ333	33kΩ	3
R180	ERDS2TJ154	150kΩ	1
R181	ERDS2TJ472	4.7kΩ	1
R182	ERDS2TJ103	10kΩ	1
R183	ERDS2TJ154	150kΩ	1
R184	ERDS2TJ472	4.7kΩ	1
R185	ERDS2TJ103	10kΩ	1
R186	ERDS2TJ154	150kΩ	1
R187	ERDS2TJ472	4.7kΩ	1
R188	ERDS2TJ103	10kΩ	1
R190	ERDS2TJ154	150kΩ	1
R191, 192	ERDS2TJ332	3.3kΩ	2
R193	ERDS2TJ154	150kΩ	1
R194	ERDS2TJ682	6.8kΩ	1
R195	ERDS2TJ223	22kΩ	1
R196	ERDS2TJ103	10kΩ	1
R197	ERDS2TJ223	22kΩ	1
R198	ERDS2TJ682	6.8kΩ	1
R199	ERDS2TJ103	10kΩ	1
R200	ERDS2TJ154	150kΩ	1
R201, 202	ERDS2TJ332	3.3kΩ	2
R203, 204	ERDS2TJ154	150kΩ	2
R205, 206	ERDS2TJ332	3.3kΩ	2
R207	ERDS2TJ154	150kΩ	1
R208	ERDS2TJ223	22kΩ	1
R209	ERDS2TJ682	6.8kΩ	1

Ref. No.	Part No.	Description	Per/Set
R210	ERDS2TJ103	10kΩ	1
R211	ERDS2TJ104	100kΩ	1
R212	ERDS2TJ223	22kΩ	1
R213, 214	ERDS2TJ473	47kΩ	2
R215	ERDS2TJ153	15kΩ	1
R216	ERDS2TJ333	33kΩ	1
R217~219	ERDS2TJ223	22kΩ	3
R220	ERDS2TJ474	470kΩ	1
R221	ERDS2TJ153	15kΩ	1
R222	ERDS2TJ224	220kΩ	1
R223	ERDS2TJ223	22kΩ	1
R224	ERDS2TJ104	100kΩ	1
R225	ERDS2TJ473	47kΩ	1
R227	ERDS2TJ393	39kΩ	1
R228	ERDS2TJ223	22kΩ	1
R229	ERDS2TJ393	39kΩ	1
R230	ERDS2TJ104	100kΩ	1
R231	ERDS2TJ473	47kΩ	1
R232	ERDS2TJ331	330Ω	1
R234, 235	ERDS2TJ473	47kΩ	2
R236	ERDS2TJ103	10kΩ	1
R237	ERDS2TJ474	470kΩ	1
R238	ERDS2TJ153	15kΩ	1
R239	ERDS2TJ224	220kΩ	1
R240	ERDS2TJ223	22kΩ	1
R241	ERDS2TJ104	100kΩ	1
R242	ERDS2TJ473	47kΩ	1
R243	ERDS2TJ103	10kΩ	1
R244	ERDS2TJ393	39kΩ	1
R245	ERDS2TJ223	22kΩ	1
R246	ERDS2TJ104	100kΩ	1
R247	ERDS2TJ393	39kΩ	1
R249	ERDS2TJ331	330Ω	1
R250, 251 ⚠	ERD2FCVG100	10Ω, 1/4W, Fuse Type	2
R252	ERDS2TJ472	4.7kΩ	1
R300	ERDS2TJ105	1MΩ	1
R301~303	ERDS2TJ103	10kΩ	3
R304	ERDS2TJ225	2.2MΩ	1
R305	ERDS2TJ332	3.3kΩ	1
R306, 307 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	2
R308	ERDS2TJ103	10KΩ	1
R310, 311	ERDS2TJ221	220Ω	2
R315, 316	ERDS2TJ102	1kΩ	2
CAPACITORS			
C2	ECEA0JKA470	47μF, 6.3V	1
C3	ECQG1H332KZ	0.0033μF	1
C4	ECRR1H104ZF	0.1μF	1
C5, 6	ECCR1H471J	470pF	2
C7	ECQG1H472KZ	0.0047μF	1
C8	ECCR1H101J	100pF	1
C9	ECRR1H104ZF	0.1μF	1
C10	ECQG1H472KZ	0.0047μF	1
C11	ECKR1E473ZV	0.047μF	1
C12, 13	ECCR1H471J	470pF	2
C14	ECCR1H101J	100pF	1
C15, 16	ECEA1CU470	47μF, 16V	2
C17, 18	ECQB1H103JZ	0.01μF	2
C19	ECKR1E473ZV	0.047μF	1
C20	ECEA1CU100	10μF, 16V	1
C21, 22	ECQB1H103JZ	0.01μF	2
C23	ECEA1HKA010	1μF, 50V	1
C24	ECRR1H104ZF	0.1μF	1
C25	ECQG1H102KZ	0.001μF	1
C26	ECQG1H332KZ	0.0033μF	1
C27	ECEA1HKA010	1μF, 50V	1
C28	ECQM1H103KV	0.01μF	1
C29	ECKR1E473ZV	0.047μF	1

Ref. No.	Part No.	Description	Per/Set
C32~39	ECQG1H222KZ	0.0022μF	8
C40	ECQG1H152KZ	0.0015μF	1
C41	ECCR1H680J	68pF	1
C42	ECQG1H152KZ	0.0015μF	1
C43	ECCR1H680J	68pF	1
C44	ECRR1H104ZF	0.1μF	1
C45, 46	ECQG1H102KZ	0.001μF	2
C47	ECCR1H471J	470pF	1
C48	ECQG1H222KZ	0.0022μF	1
C49	ECCR1H471J	470pF	1
C50, 51	ECCR1H680J	68pF	2
C52	ECQG1H332KZ	0.0033μF	1
C53	ECEA1HKA010	1μF, 50V	1
C54	ECQG1H102KZ	0.001μF	1
C55	ECRR1H104ZF	0.1μF	1
C56	ECEA1HKA010	1μF, 50V	1
C57, 58	ECEA1CU470	47μF, 16V	2
C59	ECQG1H472KZ	0.0047μF	1
C60	ECKR1E473ZV	0.047μF	1
C61	ECEA1HKA010	1μF, 50V	1
C62	ECEA1CU470	47μF, 16V	1
C63	ECEA1HKA010	1μF, 50V	1
C64	ECQG1H472KZ	0.0047μF	1
C65	ECRR1H104ZF	0.1μF	1
C66~69	ECEA1HKN010	1μF, 50V	4
C80, 81	ECCR1H220J	22pF	2
C83, 84	ECQG1H222KZ	0.0022μF	2
C86	ECQV1H474JZ	0.47μF	1
C87	ECQV1H473JZ	0.047μF	1
C88	ECQV1H474JZ	0.47μF	1
C89	ECQV1H473JZ	0.047μF	1
C90	ECCR1H680J	68pF	1
C91	ECQM1H223KV	0.022μF	1
C92	ECCR1H471J	470pF	1
C93, 94	ECCR1H101J	100pF	2
C96, 97	ECQG1H102KZ	0.001μF	2
C98, 99	ECCR1H471J	470pF	2
C100, 101	ECCR1H470J	47pF	2
C102, 103	ECQV1H473JZ	0.047μF	2
C104	ECQV1H104JZ	0.1μF	1
C105	ECCR1H470J	47pF	1
C106	ECEA1CU100	10μF, 16V	1
C107	ECEA1CU470	47μF, 16V	1
C108	ECCR1H471J	470pF	1
C109	ECQG1H102KZ	0.001μF	1
C110, 111	ECCR1H221J	220pF	2
C112, 113	ECQG1H102KZ	0.001μF	2
C114	ECEA1CU470	47μF, 16V	1
C115	ECQG1H102KZ	0.001μF	1
C116	ECEA1CU470	47μF, 16V	1
C117	ECQG1H102KZ	0.001μF	1
C118	ECEA1CU470	47μF, 16V	1
C119	ECQG1H102KZ	0.001μF	1
C120, 121	ECCR1H101J	100pF	2
C122	ECEA1CU330	33μF, 16V	1
C123, 124	ECCR1H101J	100pF	2
C125	ECEA1CU100	10μF, 16V	1
C126, 127	ECCR1H101J	100pF	2
C128	ECEA1CU100	10μF, 16V	1
C130	ECQG1H222KZ	0.0022μF	1
C131	ECEA1CU470	47μF, 16V	1
C132	ECQG1H472KZ	0.0047μF	1
C133	ECQM1H223KV	0.022μF	1
C134	ECQG1H102KZ	0.001μF	1
C135	ECQB1H103JZ	0.01μF	1
C136	ECEA1HKN010	1μF, 50V	1
C137	ECQM1H153KV	0.015μF	1
C138	ECQV1H154JZ	0.15μF	1

Ref. No.	Part No.	Description	Per/Set
C139	ECEA0JKA470	47μF, 6.3V	1
C141	ECQG1H472KZ	0.0047μF	1
C142	ECEA0JKA330	33μF, 6.3V	1
C143	ECEA1CU470	47μF, 16V	1
C144	ECQV1H154JZ	0.15μF	1
C145	ECEA1CU470	47μF, 16V	1
C146	ECEA1CU101	100μF, 16V	1
C147	ECQV1H104JZ	0.1μF	1
C148	ECQV1H473JZ	0.047μF	1
C149, 150	ECKR1E473ZV	0.047μF	2
C151, 152	ECEA1CU100	10μF, 16V	2
C163, 164	ECKR1E473ZV	0.047μF	2
C170	ECQG1H222KZ	0.0022μF	1
C171	ECEA1CU331	330μF, 16V	1
C172	ECEA1CU470	47μF, 16V	1
C183	ECQG1H222KZ	0.0022μF	1
C219	ECQG1H222KZ	0.0022μF	1
C301	ECEA1HKN010	1μF, 50V	1
C302	ECEA1HKA010	1μF, 50V	1
C303	ECCR1H221J	220pF	1
C304	ECCR1H471J	470pF	1
C305	ECCR1H221J	220pF	1

JACK JACK CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	INTEGRATED CIRCUIT			
	IC1	SVIGTLP513	Photo Coupler	1
	TRANSISTORS			
S	Q1, 2	2SA1015-GR	2SA933STRS (SUB. Part)	2
	DIODES			
	D1~5	MA165TA5	Diode	5
	COILS			
	L1~3	QLQGT3T150SA	Coil	3
	JACKS			
	JK1, 2	SJJG100A	Jack, HEADPHONES 1, 2	2
	JK3~6	QJJG003AA	Jack, LINE OUT, AUX IN	4
	JK7~9	SJSG1370A	MIDI THRU, OUT, IN	3
	RESISTORS			
	R1	ERDS2TJ104	100kΩ	1
	R2	ERDS2TJ221	220Ω	1
	R3	ERDS2TJ104	100kΩ	1
	R4	ERDS2TJ221	220Ω	1
	R5	ERDS2TJ103	10kΩ	1
	R6	ERDS2TJ221	220Ω	1
	R7	ERDS2TJ331	330Ω	1
	R8~11 ⚠	ERG1ANJP680S	68Ω, 1W, Flame-Proof	4
	R12, 13	ERDS2TJ101	100Ω	2
	CAPACITORS			
	C1	ECKR1E473ZV	0.047μF	1
	C2	ECEA0JKA470	47μF, 6.3V	1
	WIRES			
○	W1, 2	QEXGRA01009A	Wire	2

CPR UPPER CONTROL PANEL RIGHT CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	INTEGRATED CIRCUITS			
	IC1	SVIGM603A121	Gate Array	1
	IC2, 3	HD74LS07P	Hex Buffers	2
	TRANSISTORS			
	Q1~4	2SA830SB	Transistor	4
	DIODES			
	D1~31	MA165TA5	Diode	31
	D101~106	LN382G	LED (Green)	6
	D107~114	LN282R	LED (Red)	8
	SWITCHES			
	S1~31	SSHG1049A	Push Switch	31
	IC PROTECTOR			
	IP1 ⚠	ICP-N10T104	IC Protector	1
	RESISTORS			
	R1	ERDS2TJ184	180kΩ	1
	R2	ERDS2TJ221	220Ω	1
	R3~15	ERDS2TJ103	10kΩ	13
	R20~24	ERDS2TJ680	68Ω	5
	R26~31	ERDS2TJ680	68Ω	6
	R32	ERDS2TJ222	2.2kΩ	1
	CAPACITORS			
	C1	ECEA0JKA470	47μF, 6.3V	1
	C2	ECRR1H104ZF	0.1μF	1
	C3	ECBA1H101KB5	100pF	1
	C4	ECCR1H101J	100pF	1
	C5, 6	ECRR1H104ZF	0.1μF	2
	C7	ECBA1C682MR5	0.0068μF	1
	WIRE			
	W1	SWEG300A	Wire	1

CPL UPPER CONTROL PANEL LEFT CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	HD74LS07P	Hex Buffers	1
IC2	SVIGUPD7225	LCD Driver	1
DIODES			
D1~21	MA165TA5	Diode	21
D101~103, 105~120	LN282R	LED (Red)	19
D104	LN382G	LED (Green)	1
LCD DISPLAY			
LCD1	SXEG101A	LCD Display	1
SWITCHES			
S1~21	SSHG1049A	Push Switch	21
RESISTORS			
R1	ERDS2TJ184	180kΩ	1
R2~4	ERDS2TJ472	4.7kΩ	3

Ref. No.	Part No.	Description	Per/Set
R5~10	ERDS2TJ680	68Ω	6
R11	ERDS2TJ102	1kΩ	1
R12	ERDS2TJ472	4.7kΩ	1
CAPACITORS			
C1	ECRR1H104ZF	0.1μF	1
C2	ECEA0JKA470	47μF, 6.3V	1
C3	ECRR1H104ZF	0.1μF	1
C4	ECCR1H101J	100pF	1

CPSQ SEQUENCER CONTROL CIRCUIT

Ref. No.	Part No.	Description	Per/Set
DIODES			
D1~19	MA165TA5	Diode	19
D101~104, 106~110	LN282R	LED (Red)	9
D111~125	LN382G	LED (Green)	15
SWITCHES			
S1~19	SSHG1049A	Push Switch	19
VARIABLE RESISTORS			
VR1	EVD06510B24G	20kΩ B, MAIN VOLUME	1
CAPACITORS			
C1	ECRR1H104ZF	0.1μF	1
WIRE			
W1	SWEG630A	Wire	1

CPSL LOWER CONTROL PANEL LEFT CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGM603A121	Gate Array	1
IC2, 4	HD74LS07P	Hex Buffers	2
○ IC3, 5	M74LS07FP	Hex Buffers	2
TRANSISTORS			
Q1~4	2SA830SB	Transistor	4
DIODES			
D1~82	MA165TA5	Diode	82
D101~123, 125~146, 148~179	LN282R	LED (Red)	77
D124, 147	LN382G	LED (Green)	2
COMPONENT COMBINATION			
Z1	EXBPI8103JM	10kΩ×8	1
SWITCHES			
S1~82	SSHG1049A	Push Switch	82
IC PROTECTOR			
IP1 ⚠	ICP-N10T104	IC Protector	1

Ref. No.	Part No.	Description	Per/Set
RESISTORS			
R1	ERDS2TJ184	180kΩ	1
R2	ERDS2TJ221	220Ω	1
R3	ERDS2TJ222	2.2kΩ	1
R5	ERDS2TJ102	1kΩ	1
R13~16	ERDS2TJ103	10kΩ	4
R21~24	ERDS2TJ680	68Ω	4
R26~42	ERDS2TJ680	68Ω	17
CAPACITORS			
C1	ECEA0JKA470	47μF, 6.3V	1
C2	ECCR1H101J	100pF	1
C4	ECBA1C682MR5	0.0068μF	1
C5	ECCR1H101J	100pF	1
C6~8	ECRR1H104ZF	0.1μF	3
WIRE			
W1	SWEG640A	Wire	1

FDCN FD CONNECTOR CIRCUIT

Ref. No.	Part No.	Description	Per/Set
CAPACITORS			
C1	ECRR1H104ZF	0.1μF	1
C2	ECCR1H101J	100pF	1

ACP AC POWER SUPPLY CIRCUIT

Ref. No.	Part No.	Description	Per/Set
LINE FILTER			
L1 ⚠	SLTGLF3	Line Filter	1
JACKS			
JK1 ⚠	SJVD0203B	AC Inlet	1
JK2	QJSG002AA	PEDAL IN	1
SWITCH			
S1 EK X ⚠ XS XR XD	SSRG100A	Voltage Selector	1
FUSES			
F1 M MC ⚠ XM	XBA1C63NU100	6.3A, 125V	1
F1 EK X ⚠	XBA2C25TB0	T2.5A, 250V	1
F2,3 XS XR ⚠ XD	XBA2C16TB0	T1.6A, 250V	2
F3 Others ⚠	XBA2C16TB0	T1.6A, 250V	1
CAPACITORS			
C1 ⚠	ECQU2A104MN	0.1μF, 250V, Across-the Line Capacitor	1
C2 ⚠	ECKCVA1472MF	4700pF, Line-Capacitor	1
C3	ECRR1H104ZF	0.1μF	1
WIRE			
W1	SWEG660A	Wire	1
AC INLET COVER			
XL XR ⚠	SJS9334A	AC Inlet Cover, [XL][XR] areas	1
Others ⚠	SJS9231A	AC Inlet Cover, other areas	1

AS AMP & POWER SUPPLY CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	INTEGRATED CIRCUITS			
	IC1	SVIGM5291P	Switching Regulator	1
	IC2	SVIGM5F7815	+15V Voltage Regulator	1
	IC3	SVIGM5F7915	−15V Voltage Regulator	1
	TRANSISTORS			
	Q1	2SA1643	Transistor	1
S	Q2	2SA1015-GR	2SA933STRS (SUB. Part)	1
S	Q3, 4, 8∼10, 14	2SC1815GR	Transistor	6
	Q5, 11	2SA1123S	Transistor	2
	Q6, 12	2SD1277A	Transistor	2
	Q7, 13	2SB951A	Transistor	2
	DIODES			
S	D1∼8 ⚠	SVDGS3V20-15	Rectifier	8
○	D9, 10	SVDGERA1502	Diode	2
	D11	SVDGRK14S	Diode	1
	D12	MA2062LF	Zener, 6.2V	1
	D13, 14	MA165TA5	Diode	2
	D15, 16	MA4062	Zener, 6.2V	2
	COIL			
	L1	SLCG2A121TZ	Coil	1
	RELAYS			
	RL1, 2	SSYGMR30112	Relay	2
	IC PROTECTOR			
○	IP1∼4 ⚠	ICP-N50T104	IC Protector	4
	RESISTORS			
	R1, 2	ERDS2TJ103	10kΩ	2
	R3 ⚠	ERQ14AJ2R0	2Ω, 1/4W, Fuse Type	1
	R4 ⚠	ERX1ANJPR22S	0.22Ω, 1W, Flame-Proof	1
	R5	ERDS2TJ101	100Ω	1
	R6	ERDS2TJ471	470Ω	1
	R7	ERDS2TJ470	47Ω	1
	R8 ⚠	ERG1ANJP221S	220Ω, 1W, Flame-Proof	1
	R9	ER0S2TKF1001	1kΩ, ±1%	1
	R10	ER0S2TKF3571	3.57kΩ, ±1%	1
	R11	ERDS2TJ331	330Ω	1
○	R13 ⚠	ERG2ANJP331S	330Ω, 2W, Flame-Ploof	1
	R14	ERDS2TJ103	10kΩ	1
	R15	ERDS2TJ472	4.7kΩ	1
	R16	ERDS2TJ103	10kΩ	1
	R17	ERDS2TJ332	3.3kΩ	1
	R18	ERDS2TJ472	4.7kΩ	1
	R19	ERDS2TJ103	10kΩ	1
	R20	ERDS2TJ152	1.5kΩ	1
	R21	ERDS2TJ223	22kΩ	1
	R22	ERDS2TJ102	1kΩ	1
	R23	ERDS2TJ682	6.8kΩ	1
	R24	ERDS2TJ472	4.7kΩ	1
	R25	ERDS2TJ153	15kΩ	1
	R26, 27	ERDS2TJ222	2.2kΩ	2
	R28, 29 ⚠	ERX2ANJPR22S	0.22Ω, 2W, Flame-Proof	2
	R30 ⚠	ERD25FVJ4R7	4.7Ω, 1/4W, Flame-Proof	1
	R31	ERDS2TJ103	10kΩ	1
	R32	ERDS2TJ332	3.3kΩ	1
	R33	ERDS2TJ472	4.7kΩ	1
	R34	ERDS2TJ103	10kΩ	1
	R35	ERDS2TJ152	1.5kΩ	1
	R36	ERDS2TJ223	22kΩ	1
	R37	ERDS2TJ102	1kΩ	1
	R38	ERDS2TJ682	6.8kΩ	1
	R39	ERDS2TJ472	4.7kΩ	1
	R40	ERDS2TJ153	15kΩ	1
	R41, 42	ERDS2TJ222	2.2kΩ	2
	R43, 44 ⚠	ERX2ANJPR22S	0.22Ω, 2W, Flame-Proof	2
	R45 ⚠	ERD25FVJ4R7	4.7Ω, 1/4W, Flame-Proof	1
	R46 M KM ⚠	ERQ14AJ2R0	2Ω, 1/4W, Fuse Type	1
	CAPACITORS			
	C2∼5	ECEA1VU332	3300μF, 35V	4
	C6	ECEA1VKG100	10μF, 35V	1
	C7	ECCR1H101J	100pF	1
	C8, 9	ECEA0JU102	1000μF, 6.3V	2
	C15, 16	ECEA1VKG100	10μF, 35V	2
	C17	ECKR1E473ZV	0.047μF	1
	C18	ECEA1HKN010	1μF, 50V	1
	C19	ECQG1H102KZ	0.001μF	1
	C21	ECEA0JKA470	47μF, 6.3V	1
	C22	ECEA1VKG100	10μF, 35V	1
	C23	ECCR1H101J	100pF	1
	C24	ECCR1H221J	220pF	1
	C25	ECRR1H104ZF	0.1μF	1
	C26	ECEA50Y8R2	8.2μF, 50V	1
	C27	ECEA1HKN010	1μF, 50V	1
	C28	ECQG1H102KZ	0.001μF	1
	C30	ECEA0JKA470	47μF, 6.3V	1
	C31	ECEA1VKG100	10μF, 35V	1
	C32	ECCR1H101J	100pF	1
	C33	ECCR1H221J	220pF	1
	C34	ECRR1H104ZF	0.1μF	1
	C35	ECEA50Y8R2	8.2μF, 50V	1

MKBU UPPER MANUAL KEYBOARD CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	INTEGRATED CIRCUIT			
	IC1	MN50020PGV	Gate Array	1
	DIODES			
S	D1∼88	MA162A	MA150IR (SUB. Part)	88
	OSCILLATOR			
	X1	EF0FC4004A3	4MHz, Ceramic Oscillator	1
	COMPONENT COMBINATION			
	Z1	EXBPI8472JM	4.7kΩ×8	1
	SWITCHES			
	S1∼7, 38∼44	SSPG7004A	Rubber Switch (7 pcs. on one)	2
	S8∼37	SSPG6004A	Rubber Switch (6 pcs. on one)	5
	CAPACITORS			
	C2	ECRR1H104ZF	0.1μF	1
	C3	ECCR1H471J	470pF	1
	C4	ECEA0JKA470	47μF, 6V	1

MKBL LOWER MANUAL KEYBOARD CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	DIODES			
S	D1∼88	MA162A	MA150IR (SUB. Part)	88
	SWITCHES			
	S45∼51, 82∼88	SSPG7004A	Rubber Switch (7 pcs. on one)	2
	S52∼81	SSPG6004A	Rubber Switch (6 pcs. on one)	5

FDC FD CONTROL CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	INTEGRATED CIRCUITS			
	IC1	SVIGD72067C	Floppy Disk Controller	1
	IC2	SVIGM74H02	Quad 2-input NOR Gates	1
	IC3	SVIGM74H00	Quad 2-input NAND Gates	1
	IC4	SVIGM74H14	Hex Schmitt-trigger Inverters	1
	IC5	SVIGM74H04	Hex Inverters	1
	OSCILLATOR			
	X2	QSXG1A3200A	32MHz, Quartz Oscillator	1
	COMPONENT COMBINATIONS			
	Z1, 2	EXBPI8103JM	10kΩ×8	2
	Z3	EXBPI8102JM	1kΩ×8	1
	RESISTORS			
	R1∼4	ERDS2TJ472	4.7kΩ	4
	R5, 6	ERDS2TJ153	15kΩ	2
	R7	ERDS2TJ103	10kΩ	1
	CAPACITORS			
	C1, 2	ECBA1H100J	10pF	2
	C6	ECEA0JKA331	330μF, 6.3V	1
	C8∼11	ECRR1H104ZF	0.1μF	4
	C12	ECBA1H100J	10pF	1

PKB PEDAL KEYBOARD CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	TRANSISTORS			
S	Q1, 2, 4	2SA1015-GR	2SA933STRS (SUB. Part)	3
S	Q5∼17	2SC2320LFG	2SC1310FG (SUB. Part)	13
	SWITCHES			
	S1∼13	SHGG50A	Rubber Switch (5 pcs. on one)	3
	RESISTORS			
	R1, 2	ER0S2CKF4700	470Ω, ±1%	2
	R3	ERDS2TJ472	4.7kΩ	1
	R5	ER0S2CKF4700	470Ω, ±1%	1
	R7	ERDS2TJ472	4.7kΩ	1
	R8	ERDS2TJ103	10kΩ	1
	R9	ERDS2TJ472	4.7kΩ	1
	R10	ERDS2TJ103	10kΩ	1
	R11	ERDS2TJ472	4.7kΩ	1
	R12	ERDS2TJ103	10kΩ	1
	R13	ERDS2TJ472	4.7kΩ	1
	R14	ERDS2TJ103	10kΩ	1
	R15	ERDS2TJ472	4.7kΩ	1
	R16	ERDS2TJ103	10kΩ	1
	R17	ERDS2TJ472	4.7kΩ	1
	R18	ERDS2TJ103	10kΩ	1
	R19	ERDS2TJ472	4.7kΩ	1
	R20	ERDS2TJ103	10kΩ	1
	R21	ERDS2TJ472	4.7kΩ	1
	R22	ERDS2TJ103	10kΩ	1
	R23∼29	ER0S2CKF4700	470Ω, ±1%	7
	R30	ER0S2CKF1001	1kΩ, ±1%	1
	R32	ERDS2TJ472	4.7kΩ	1
	R33	ERDS2TJ103	10kΩ	1
	R34	ERDS2TJ472	4.7kΩ	1
	R35	ERDS2TJ103	10kΩ	1
	R36	ERDS2TJ472	4.7kΩ	1
	R37	ERDS2TJ103	10kΩ	1
	R38	ERDS2TJ472	4.7kΩ	1
	R39	ERDS2TJ103	10kΩ	1
	R40	ERDS2TJ472	4.7kΩ	1
	R41	ERDS2TJ103	10kΩ	1
	R42∼45	ER0S2CKF4700	470Ω, ±1%	4
	R46	ER0S2CKF2201	2.2kΩ, ±1%	1
	R51	ERDS2TJ472	4.7kΩ	1

EXP EXPRESSION CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	CDS			
	CS1	SVEG5	Light Sensitive Device	1

■ WIRING PARTS

	Ref. No.	Part No.	Description	Per/Set
○	W1	QEXGSA06070A	Connector with Wire	1
○	W2	QEXGSA10080A	Connector with Wire	1
○	W3	QEXGSS11035A	Connector with Wire	1
○	W4	QEXGSS08035A	Connector with Wire	1
○	W5	QEXGSS13030A	Connector with Wire	1
○	W6	QEXGSS03055A	Connector with Wire	1
○	W7	QEXGSA10055A	Connector with Wire	1
○	W8	QEXGSA12050A	Connector with Wire	1
○	W9	QEXGSS12045A	Connector with Wire	1
○	W10	QEXGSS08040A	Connector with Wire	1
○	W11	QEXGSS08070A	Connector with Wire	1
○	W12	QEXGSA07105A	Connector with Wire	1
○	W13	QEXGSS09120A	Connector with Wire	1
○	W14	QEXGSS05040A	Connector with Wire	1
○	W15	QEXGSA13025A	Connector with Wire	1
○	W16	QEXGSA12030A	Connector with Wire	1
○	W17	QEXGSA04085A	Connector with Wire	1
○	W18	QEXGSS12090A	Connector with Wire	1
○	W19	QEXGVH03160B	Connector with Wire	1
○	W20	QEXGVH07025B	Connector with Wire	1
○	W21	QEXGST12160A	Connector with Wire	1
○	W22	QEXGVH05060B	Connector with Wire	1
○	W23	QEXGEH03075B	Connector with Wire	1
○	W24	QEXGZA08100A	Pedal Cable	1
○	W25	QEXGVH06170B	Connector with Wire	1
	W26	SWKG0326LTA	Connector with Wire	1
	W27	SWKG04158LSA	Connector with Wire	1
	W28	SWKG03127ZC	Connector with Wire	1

REPLACEMENT PARTS LIST.....Cabinet and Chassis Parts

Notes:

1. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
2. ○ mark are new parts.
3. For part No. with area mark, check the area when placing an order.
4. Keyboard chassis part No. with mark (NLA) is no longer available after production discontinuation of the complete set.

■ CABINET & CHASSIS PARTS

Ref. No.	Part No.	Description	Per/Set
POWER SWITCH			
S1 ⚠	SSHG1050A	Power Switch	1
SPEAKERS			
SP1, 2	EAS20PL255A	Speaker, 20cm 4Ω	2
SP3, 4	EAS15S09A	Speaker, 13×6cm 8Ω	2
TRANSFORMER			
○ T1 M MC ⚠ XM	QTPG1N001A	Power Transformer	1
○ T1 EK X ⚠ XR XS XD	QTPG1N004A	Power Transformer	1
○ T1 Other areas ⚠	QTPG1N003A	Power Transformer	1
POWER CORD & PLUG			
PC1 EK XS ⚠ XD	QJAG001AA	AC Power Cord	1
PC1 XL XR ⚠	SJAG61	AC Power Cord	1
PC1 M MC ⚠ XM	SJAG62	AC Power Cord	1
PC1 EL EE ⚠ EM EF EP EA EH X	SJAG65	AC Power Cord	1
PC2 X ⚠	SJP5213-1	Attachment Plug	1
PC3 XD ⚠	SJPG1350A	Power Plug	1
DIODE			
D1	LN29RP	LED, Power Indicator	1
CABINET PARTS			
1	SKGG1B110D	Clear Panel, Music Rack	1
2	SHRGA7210A	Felt	1
3	SUWG3390A	Bracket	2
4	SBLG230B	Stay	2
○ 5	SGXG3230B	Ornament	1
○ 6	QKQGA039AA	Top Cover	1
○ 6-1	QMRG7021AA	Sleeve	2
6-2	SGBG160A	Technics Badge	1
6-3	SUWG1140A	Bracket	2
○ 7	QKQGF005AA	Sliding Cover	1
7-1	SGXG419A	Ornament	1
7-2	SBEG40A	Staple	1
7-3	SBEG31A	Lock	1
7-4	SBHG6007-1	Hinge	3
7-5	SHRG9930A	Catch, Guide Rail	10
7-6	SHSG3990A	Felt	2
7-7	SHSG119	Felt	6
7-8	SHSG3560A	Felt	2
8	SBEG60A	Key	1
○ 9	QGPG0032AB	Upper Control Panel	1
○ 10	QKWG003AA	Display Cover Panel	1
11	SHSG6170A	Felt	1
12	SHSG6160A	Felt	1

Ref. No.	Part No.	Description	Per/Set
○ 13	QGPG0033AB	Lower Control Panel, Left	1
○ 14	QGPG0034AB	Lower Control Panel, Right	1
○ 15	QYPG1016AA	Cover	1
15-1	SHSG5820A	Felt	1
15-2	SHSG5830A	Felt	1
○ 16	QMFG4054AA	Felt	1
○ 17	QMFG4055AA	Felt	1
19	SUWG3351A	Bracket	1
○ 20	QMRG2013AA	Insulator	1
○ 21	QYPG1015AB	Jack Panel	1
22	SNEG1700A	Latch	4
○ 23	QGKG0056AA	Ornament	1
○ 24	QSCG037A	Shield Parts	1
○ 25	QKQGD023AA	Rear Board, Upper Cabinet	1
○ 26 EK X XR XS XD	SMKG3483A	AC Panel	1
○ 26	SMKG3482A	AC Panel	1
27	SKEG7831A	Guide Rail, Right	1
28	SKEG7830A	Guide Rail, Left	1
○ 29	QKSGE001BA	Ornament	1
30	SHSG2870A	Felt	1
○ 31	QMFG1072AA	Felt	2
32	SHSG7020A	Felt	2
33	SUWG3010A	Bracket	2
○ 34	SUWG3001A	Bracket	2
○ 35	QKUG1012AAK	Rear Board, Speaker Box	1
○ 36	QKUG1013AA	Rear Board, Lower Cabinet	1
37	SHRG1120A	Cord Clamper	1
38	SHRG1110A	Cord Clamper	1
○ 39	SHRG2120D	Foot	4
○ 40	QKAG0004AA	Foot	1
41	SUWG3020A	Bracket	2
42	SUWG3350A	Bracket	1
43	SWKG03127ZC	Wire with Connector	1
○ 44	QEXGZA08100A	Pedal Cable	1
45	SXVG5110A	Expression Pedal	1
45-1	SSHG14	Foot Switch	1
45-2	RJS205ZA	Socket	1
45-3	SHGG908	Lamp Holding Rubber	1
45-4	XAMR55P	Lamp	1
46	SHRG1230A	Cord Clamper	1
47	SUWG219	Binder	11
○ 48	QQLG033AA	MIDI Seal	1
○ 49	QQLG034AA	MIDI Seal	1
50 EK	EME213DV	Digital Disk Drive Unit	1
51 EK	SUVG1282A	Cover	1
52 EK	SHRG9850A	P.C.B. Holder	3
53 EK	QMFG1066AA	Felt	1
54 EK	QEUGR0W10A	Flat Cable	1
55 EK	SHRG9490A	Cap	1
56 M MC XM	SHRG1270A	Mounting Base	3
57 EZ XL	QLZG001A	Core	1
58 EZ XL	QLQGTRCC20	Core	2
59	QMFG4057AA	Felt	1
BUTTOUN			
○ 60	QGUG1102AA01	Button	1
○ 61	QGUG1103AA01	Button	1

Ref. No.	Part No.	Description	Per/Set
○ 62	QGUG1104AA01	Button	1
○ 63	QGUG1105AA01	Button	1
○ 64	QGUG1106AA	Button	1
○ 65	QGUG1107AA	Button	2
○ 66	QGUG1108AA01	Button	1
○ 67	QGUG1109AA01	Button	1
○ 68	QGUG1110AA01	Button	2
○ 69	QGUG1111AA01	Button	1
○ 70	QGUG1113AA01	Button	1
○ 71	QGUG1114AA01	Button	1
○ 72	QGUG1115AA01	Button	1
○ 73	QGUG1116AA	Button	1
○ 74	QGUG1117AA01	Button	1
○ 75	QGUG1118AA01	Button	1
○ 76	QGUG1120AA01	Button	1
○ 77	QGUG1121AA01	Button	1
○ 78	QGUG1122AA01	Button	2
○ 79	QGUG1123AA01	Button	2
○ 80	QGUG1124AA01	Button	2
○ 81	QGUG1125AA01	Button	2
○ 82	QGUG1127AA01	Button	1
○ 83	QGUG1128AA01	Button	1
○ 84	QGUG1129AA	Button	1
○ 85	QGUG1130AA	Button	1
○ 86	QGUG1131AA	Button	1
○ 87	QGUG1132AA	Button	1
○ 88	QGUG1133AA01	Button	1
89	SBNG7031A	Knob, Main Volume	1
90	QGUG1040AA	Button, Power Switch	1
PEDAL KEYBOARD			
91	SHGG50A	Rubber Switch (5 pcs. on one)	3
92	SHSG1600B	Felt	1
93	STBG4011A	Key Guide	1
94	SHSG1460A	Felt	13
95	STBG1091C	White Key	8
96	STBG2052A	Black Key	5
97	SUSG180A	Spring	13
98	SHGG8130A	Rubber	13
99	SHRG9240A	Spacer	13
MANUAL KEYBOARD			
100	STBG1100A	White Key (C and F Key)	14
101	STBG1130A	White Key (G Key)	8
102	STBG1140A	White Key (A Key)	8
103	STBG1120A	White Key (E and B Key)	14
104	STBG1110A	White Key (D Key)	6
105	STBG1150A	White Key (Top Octave C Key)	2
106	STBG2070A	Black Key	36
107	SUSG270A	Spring	88
108	SHSG1931A	Felt	2
109	SHSG3960A	Felt	2
110	SHGG9050A	Key Guide Rubber	88
111	SHRGA9010A	Spacer	4
112	SHRGA9021A	Spacer	2
113	SHRGA9030A	Spacer	2
114	SSPG7004A	Rubber Switch (7 pcs. on one)	4
115	SSPG6004A	Rubber Switch (6 pcs. on one)	10
116 (NLA)	STBG6106A	Chassis	2
BENCH (M and XM areas only)			
○ 117	SKZGC850A	Seat	1
○ 117-1	SBHG50B	Hinge	2
117-2	SBLG70A	Stay	1

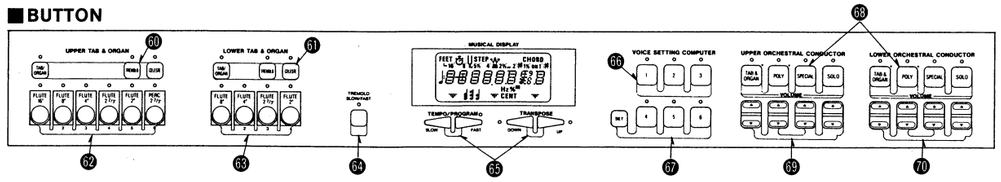
Ref. No.	Part No.	Description	Per/Set
○ 118	QKQGD026AA	Wood Frame	1
118-1	SBHG40A	Latch	1
119	SKZGC471D	Leg	4
120	SBEG190A	Spanner	1
BENCH (except for M and XM areas)			
○ 121	QKQGA033AAK	Seat	1
○ 122	QKQGZ044AAK	Leg	4
○ 123	QFBG007AA	Spanner	1
SCREWS & WASHERS			
N1	XSB4+10FVC	Screw	2
N2	XTB3+10JFVC	Screw	2
N3	XTS35+20A	Screw	4
N4	XTS35+12A	Screw	19
N5	XTS3+10AFVC	Screw	6
N6	XTS4+12A	Screw	20
N7	XTS3+12A	Screw	3
N8	XTB4+12A	Screw	32
N9	XTW3+10Q	Screw	56
N10	SNEG2620A	Speed Nut	1
N11	XYN5+C10	Screw with Washer	1
N12	XTB3+5C	Screw	27
N13	XTW3+10T	Screw	10
N14	SNEG770A	Washer	6
N15	XNS12FZ	Nut	6
N16	XTB4+10BFZ	Screw	10
N17	XYN4+F30	Screw with Washer	1
N18	XTT4+20AFZ	Screw	8
N19	XYN4+F14	Screw with Washer	4
N20	XTW3+8JFZ	Screw	2
N21	XTB35+12A	Screw	15
N22	XTT4+14A	Screw	10
N23	XTT4+30A	Screw	2
N24	SNEG2660A	Screw	1
N25	SNEG2270A	Screw with Washer	4
N26	XTB3+8BFVC	Screw	2
N27	XTB35+20A	Screw	5
N28	XTT35+10AFVC	Screw	6
N29	QHDG006AA	Screw	7
N30	XSN5+85FVC	Screw	1
N31	XWA5B	Washer	1
N32	SNEG150A	Washer	1
N33	XTT35+30AFZ	Screw	11
N34	XTT4+16AFZ	Screw	10
N35	SNE499-1	Nut	8
N36	XYN3+F30	Screw with Washer	2
N37	XYN4+F20FZ	Screw with Washer	6
N38	XTB3+6B	Screw	11
N39	XTB35+25A	Screw	8
N40	XTN26+6B	Screw	1
N41	XNG5BS	Nut	13
N42	SNEG1720B	Bolt	13
N43	XTB35+14A	Screw	1
N44	XTT4+16A	Screw	4
N45	XWA4B	Washer	1
N46 EK	XSS3+6FZ	Screw	4
N47	XTW3+10T	Screw	12
N48	XNH10G	Nut	4
N49	XWB10B	Washer	4
N50	XTB35+14AFVC	Screw	10
N51	XTS3+14A	Screw	4
N52	XTS3+14AFVC	Screw	4
N53 M MC	XYN3+C10	Screw with Washer	1
N54 XM EZ	XNG3B	Nut	1
N55 XL	XTB3+16A	Screw	1

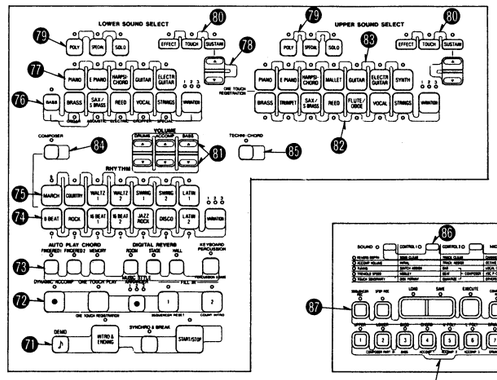
CABINET PARTS LOCATION

1 2 3 4 5 6 7 8 9 10

A B C D E F

■ BUTTON





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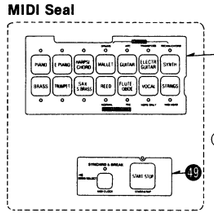

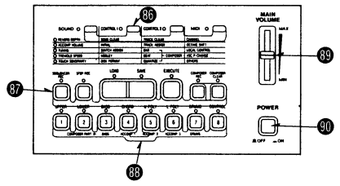

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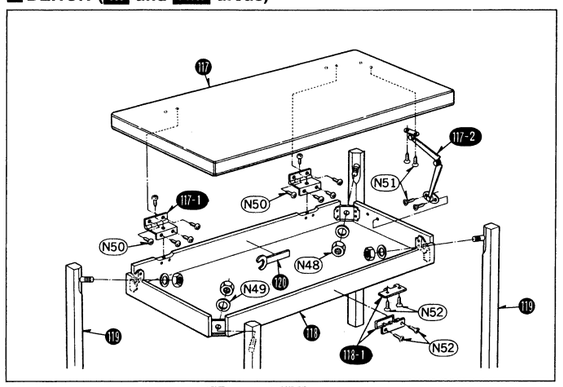
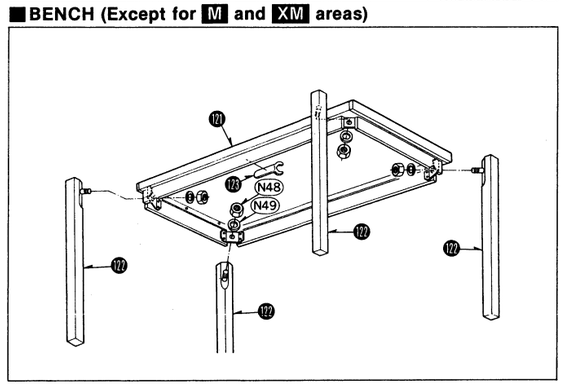
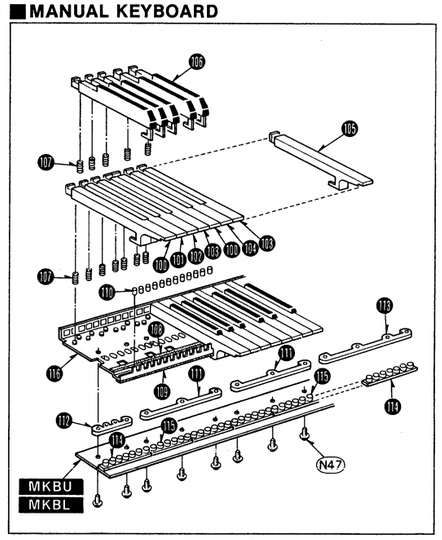
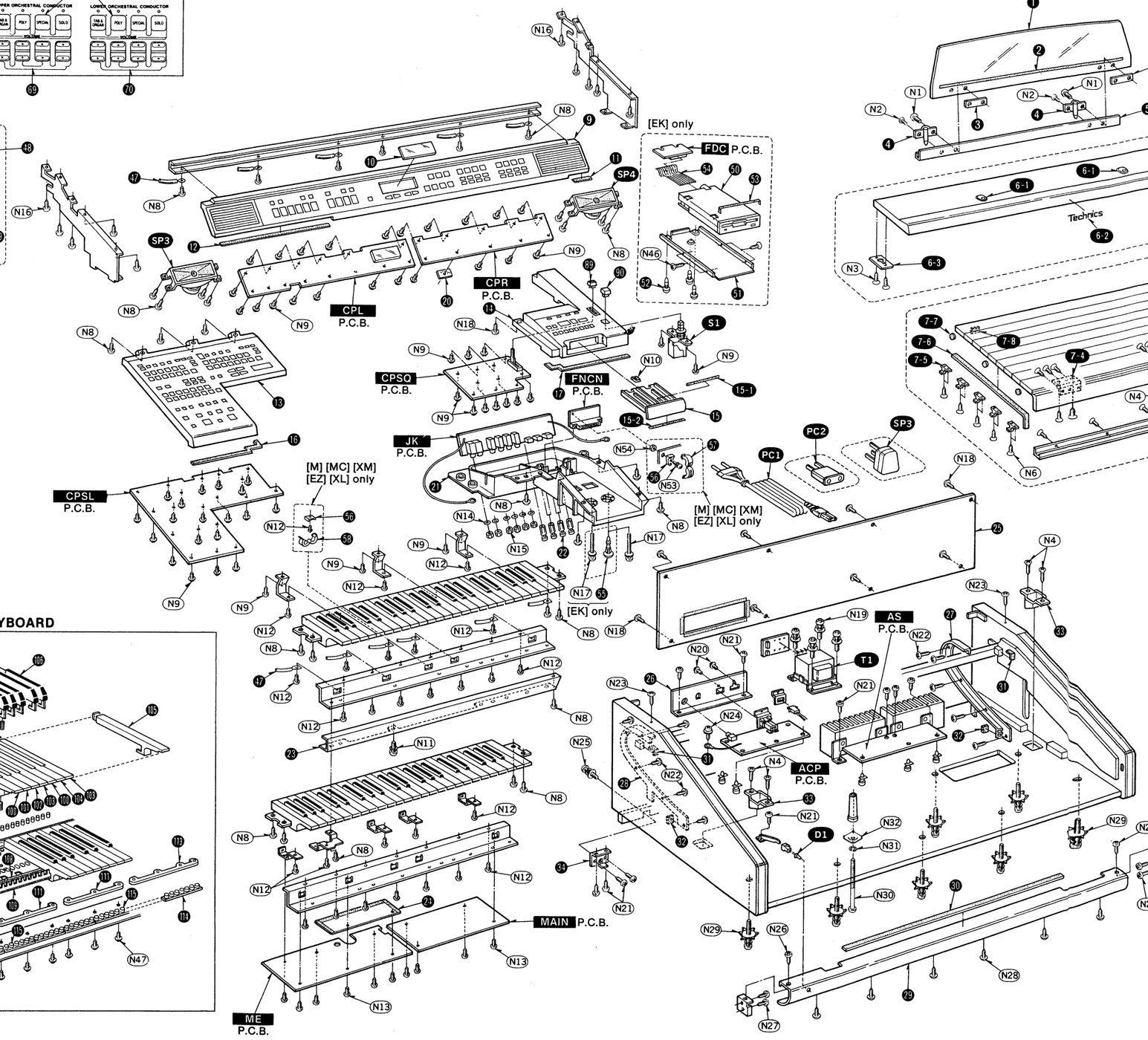


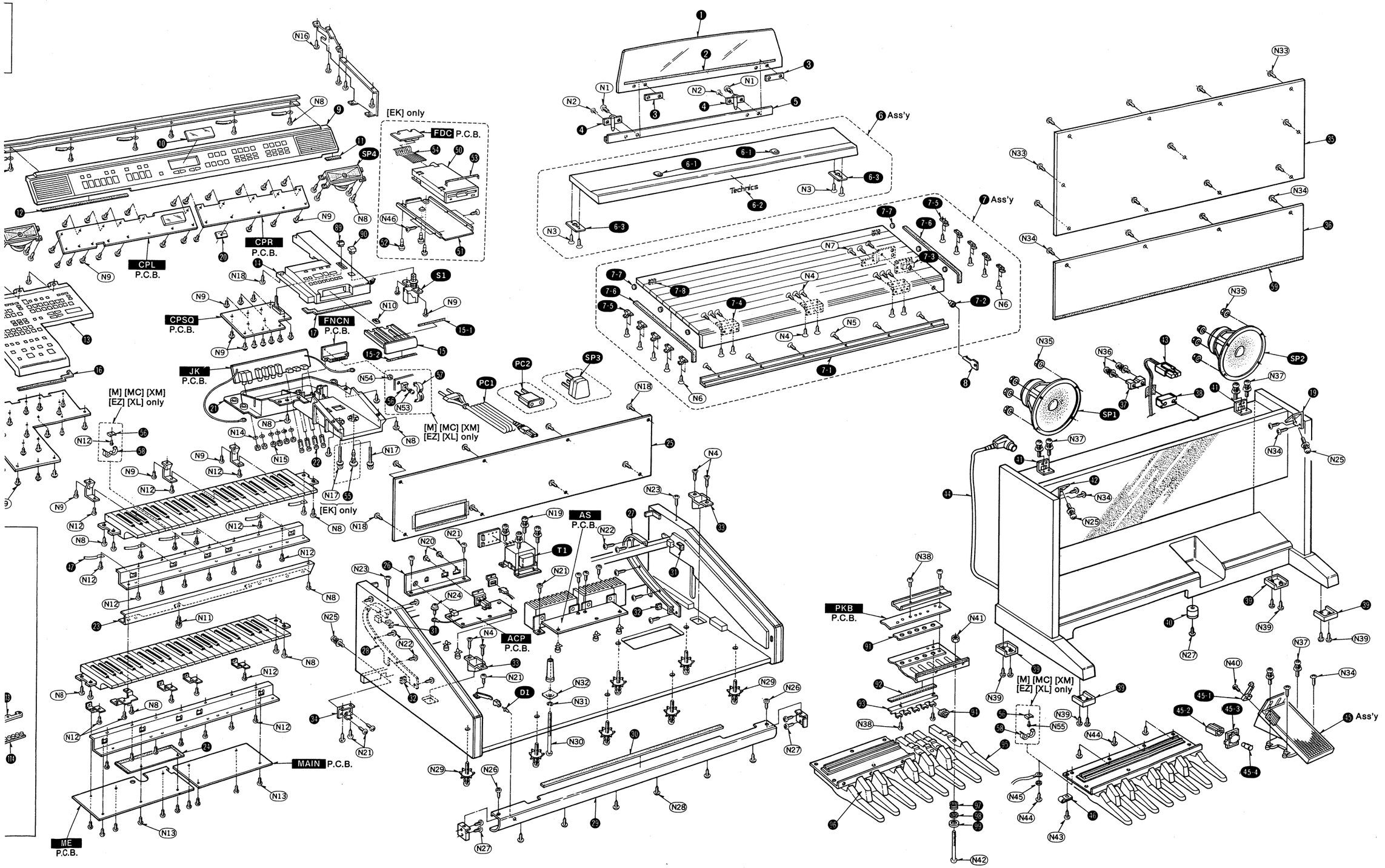
■ BENCH (Except for M and XM areas)



■ MANUAL KEYBOARD



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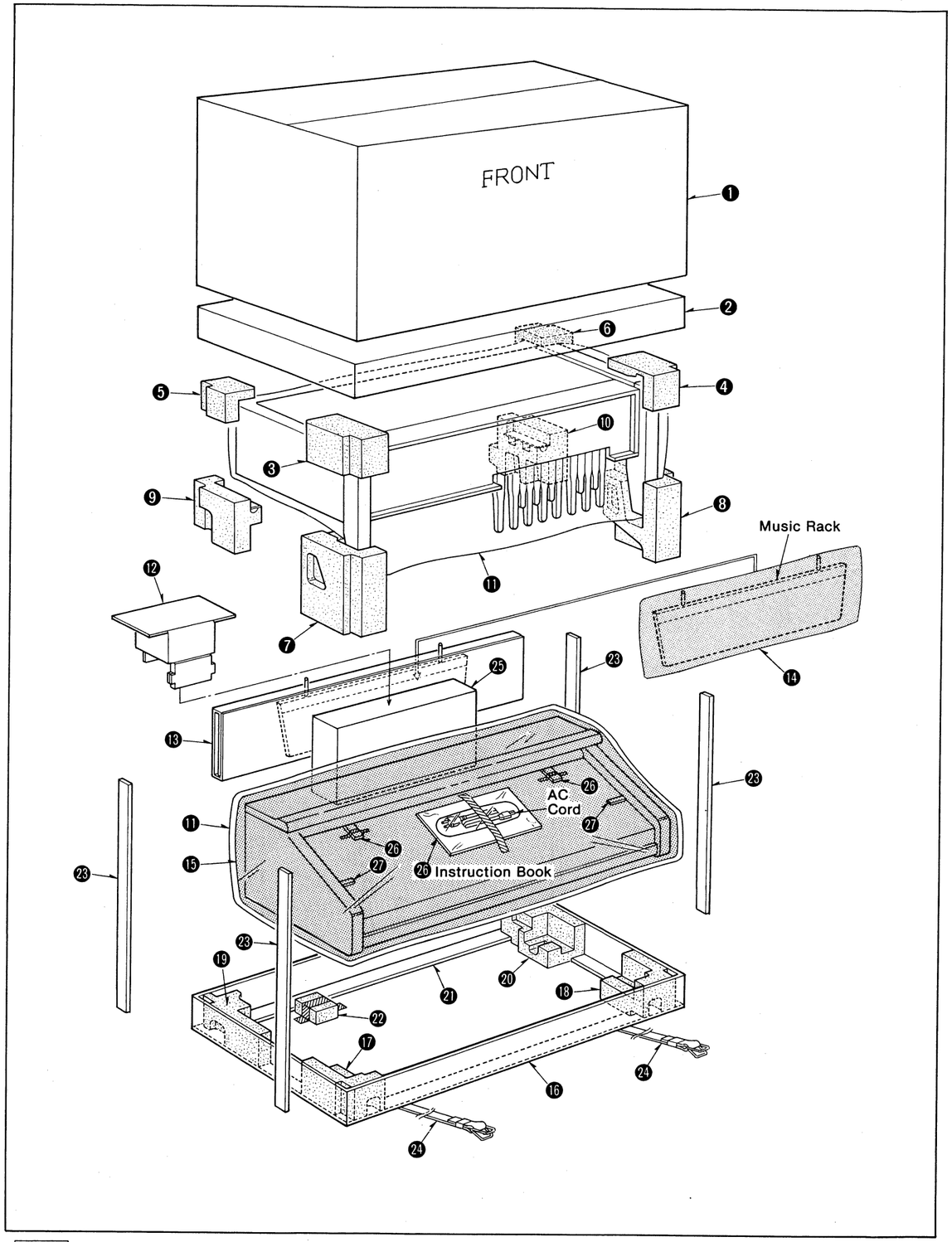
CPL P.C.B.
CPR P.C.B.
CPSQ P.C.B.
FNCN P.C.B.
JK P.C.B.
[M] [MC] [XM] [EZ] [XL] only
[EK] only
AS P.C.B.
ACP P.C.B.
MAIN P.C.B.
ME P.C.B.
PKB P.C.B.
[M] [MC] [XM] [EZ] [XL] only
6 Ass'y
7 Ass'y
45 Ass'y
Technics

PACKING



■ PACKING PARTS

Ref. No.	Part No.	Description	Per/Set
○ 1	QPGG0105AA	Carton	1
○ 1 M	QPGG0109AA	Carton	1
○ 2	QPGG0107AA	Top Case	1
○ 3	QPNG0195AA	Pad	1
○ 3 M	QPNG0216AA	Pad	1
○ 4	QPNG0196AA	Pad	1
○ 4 M	QPNG0217AA	Pad	1
○ 5	QPNG0197AA	Pad	1
○ 5 M	QPNG0218AA	Pad	1
○ 6	QPNG0198AA	Pad	1
○ 6 M	QPNG0219AA	Pad	1
○ 7	QPNG0207AA	Pad	1
○ 8	QPNG0208AA	Pad	1
○ 9	QPNG0209AA	Pad	1
○ 10	QPNG0210AA	Pad	1
11	SPHG220A	Polyethylene Bag	2
○ 12	QPGG0108AA	Pad	1
○ 12 M	QPGG0110AA	Pad	1
13	SPNG2077A	Music Rack Case	1
○ 14	QPHG039AA	Protection Cover	1
15	SPHG280A	Protection Sheet	1
○ 16	QPGG0106AA	Bottom Case	1
○ 17	QPNG0211AA	Pad	1
○ 18	QPNG0212AA	Pad	1
○ 19	QPNG0213AA	Pad	1
○ 20	QPNG0214AA	Pad	1
○ 21	QPQG011AA	Frame	1
○ 22	QPNG0215AA	Pad	1
○ 23	QPQG012AA	Prop	4
○ 23 M	QPQG013AA	Prop	4
24	SPSG40A	Band	1
○ 25	QPZGM007A	Packing Case, Bench	1
○ 25 M	QPZGM008A	Packing Case, Bench	1
26	SPNG5161A	Spacer	2
27	SHSG2090A	Felt	2
INSTRUCTION BOOK			
○ 28 EN	QQFGEN4AA	Instruction Book	1
○ 28 M	QQFGEN4CA	Instruction Book	1
○ 28 MG	QQFGEN4DA	Instruction Book	1
○ 28 EB EA	QQFGEN4EA	Instruction Book	1
○ 28 EW	QQFGEN4FA	Instruction Book	1
○ 28 EF	QQFGEN4GA	Instruction Book	1
○ 28 EH	QQFGEN4HA	Instruction Book	1
○ 28 EP XH	QQFGEN4JA	Instruction Book	1
○ 28 X	QQFGEN4KA	Instruction Book	1
○ 28 EK XL XR XS XD	QQFGEN4LA	Instruction Book	1

Select